HP Tower Server tc3100
Operations and Maintenance Guide

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Audience Assumptions

This guide is for the person who installs, administers, and troubleshoots LAN servers. Hewlett-Packard Company assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

For installation instructions, refer to the Installation Sheet included with the HP Server tc3100.

Contents

1   Controls and Indicators

This chapter describes the controls, ports, and indicators on the front and rear of the HP Server tc3100.

Front Panel

The front panel of the HP Server tc3100 provides the controls and indicators commonly used when operating the server. See Figure 1-1 and Figure 1-2. Table 1-1 describes the LED indicators.
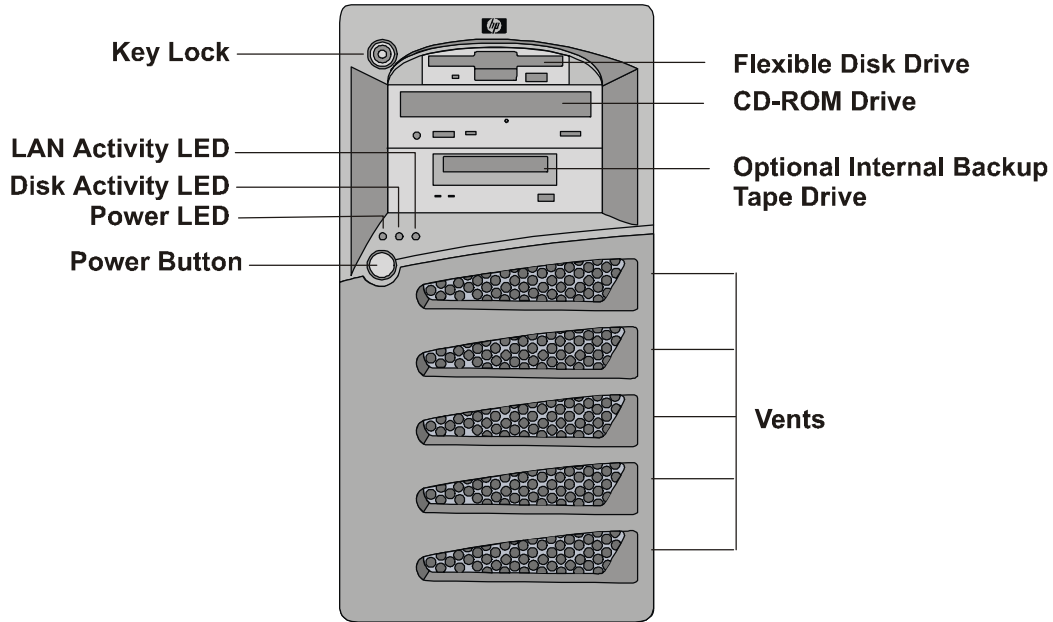
Figure 1-1. HP Server tc3100 with Cold Swap Hard Drives
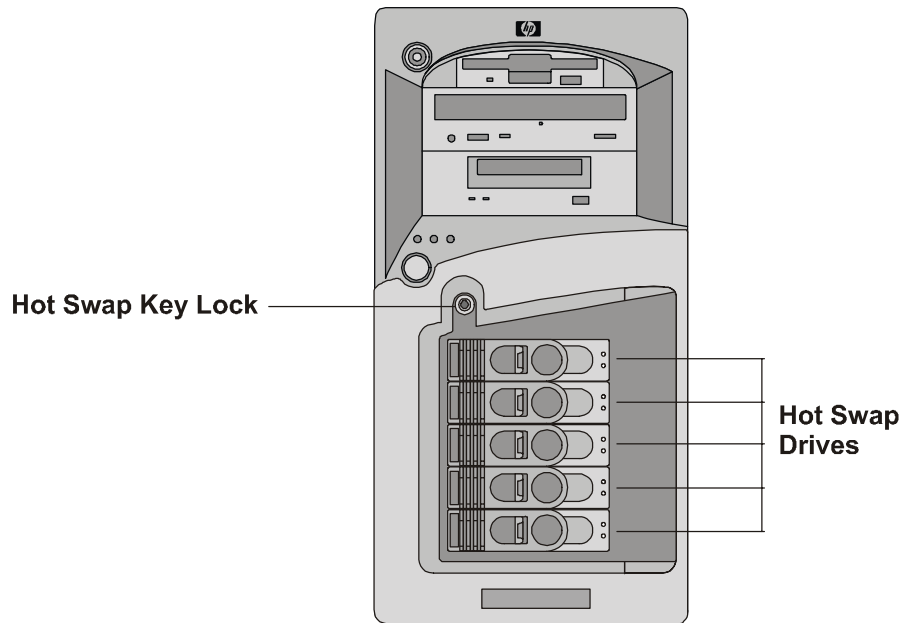
Figure 1-2. HP Server tc3100 with Hot Swap Hard Drives

Table 1-1. Control Panel Switches and Indicators

Control/Indicator	Description
Power On/Off/Sleep Button	The power switch turns the HP server power On or Off. If sleep states are available, it also transitions between Power On and sleep states.
	Sleep states are NOS dependent and only available if your NOS supports power management based on the ACPI (Advanced Configuration and Power Interface) standard. Refer to "Applying Power to the HP Server" and "Sleep States (ACPI)" later in this chapter.
Power LED	• **Steady green** indicates the server is operating normally.
	• **Blinking green** indicates the server is in a sleep state and under ACPI control.
	• **Off** (unlit) indicates the server is powered off or in standby mode.
Disk Activity LED	• **Blinking amber** indicates SCSI disk drive activity.
	• **Off** (unlit) indicates inactive operation.
LAN Activity LED	• **Blinking green** indicates LAN activity.
	• **Off** (unlit) indicates inactive operation.

Additional Controls and Indicators

Storage devices provide additional controls and indicators as shown in Figure 1-3. See Table 1-2 for backup tape drive LED codes.
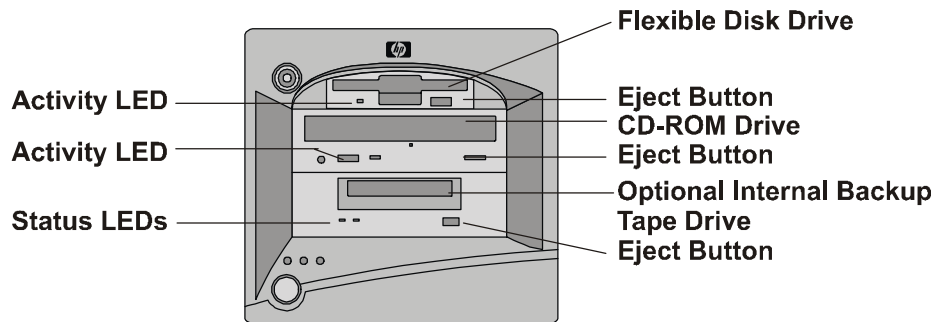
Figure 1-3. Control Panel Indicators

Table 1-2. Backup Tape Drive LED Codes

Left LED	Right LED	Definition
Off	Off	No Power
On	Off	Cartridge Loaded, but No activity
Flashing*	Off	Cartridge Loaded and Active
Pulsing**	Off	Loading/Unloading/Ejecting/Power-On
Off	On	Self Test Fail
Off	Pulsing**	No Cartridge, but Caution (cleaning required)
On	Pulsing**	Cartridge Loaded, but Caution (cleaning required)
Flashing*	Pulsing**	Cartridge Loaded, Drive Active, Caution (cleaning required)
Pulsing**	Pulsing**	Cartridge Loading/Unloading, Caution (cleaning required)

  * Flashing at 4-Hz rate

 ** Pulsing at 2-Hz rate

NOTE   For more information on the HP Tape Drive and its error codes, refer to the documentation provided with the tape drive or refer to Hewlett-Packard's web site, at:

     http://www.hp.com/

Refer to Chapter 3, "Installing and Configuring," for installation information.

Hot Swap Hard Drive Indicators

Each of the hot swap hard drives has two LED indicators:

- Status Indicator

  This LED indicates the drive operating condition: normal, warning, or failure.

- Activity Indicator

  This LED indicates the disk drive access activity. This LED indicator is controlled by the disk drive directly. When a drive is accessed, the LED indicator shows a green light.

Table 1-3 and Table 1-4 describe the LED signals used to indicate the operation status of a disk drive.

Table 1-3. Hot Swap Hard Drive Operation Status Conditions

Condition	LED	Signaling	Note
Drive access	Activity	**Green (flashing)**	Under HDD control.[1]
Drive fault	Status	**Amber (solid)**	
Drive predictive fault	Status	**Amber (flashing)**	
Missing management PCA or jumper cable	Status	**Amber (solid)**	For all HDD on SCSI bus A and/or B.
Drive/slot normal (drive present)	Status	**Green**	Pass through mode.
Drive/slot normal (drive not present)	Status	**OFF**	Pass through mode.

1.   During disk drive spin-up or a hung-up situation, the activity LED may stay solid green for a long period.

Table 1-4. Hot Swap Hard Drive LED Indicators

Status LED	Activity Status LED
• **Off**: Normal or unit not powered	• **Off**: Normal
• **Green (solid)**: - Normal and under power • - I/O activity	• **Green (flashing)**: I/O activity • **Green** (**solid** for more than one minute): Disk spinning up or "hung"
• **Amber (flashing)**: predictive failure	
• **Amber (solid)**: hard drive failure	

Rear Panel

The ports and connectors at the rear are listed below and shown in Figure 1-4.

- The power connector accepts a standard power cable to connect the HP Server with a UPS or the site power source.

- The mouse port accepts a standard mouse with a PS/2 connector.

- The keyboard port accepts a standard keyboard with a PS/2 connector.

- Two USB ports are provided for printers, scanners, and external modems.

- The LAN port is an embedded controller based on Intel's 82550 10/100 BaseT Fast Ethernet controller. It has an RJ-45 LAN connector and two LEDs to indicate LAN speed and valid connection or activity. Table 1-5 describes the LED indicators.

- The Serial Port A is a standard serial port.

- The Parallel Port is a standard parallel port, which supports Extended Capabilities Port (ECP)/Enhanced Parallel Port (EPP).

- The Serial Port B is a standard serial port.

- The external SCSI port provides access to external SCSI devices, typically an external SCSI tape backup device.
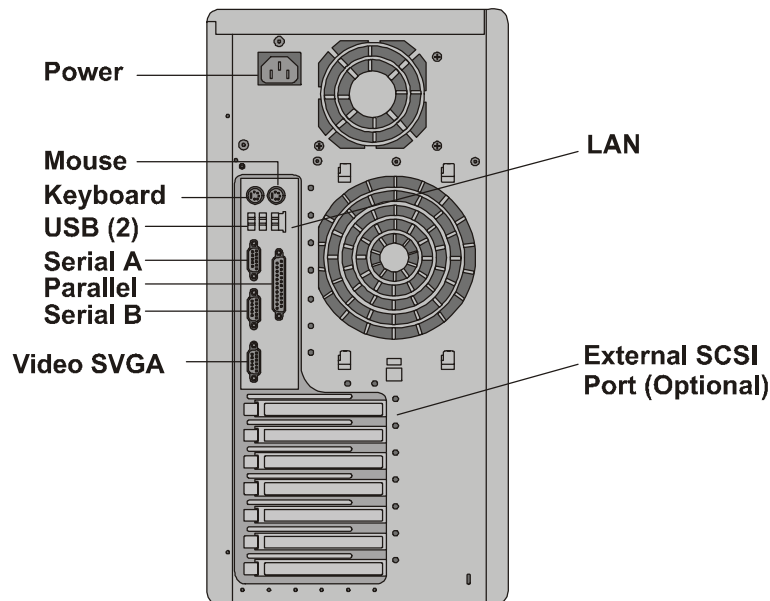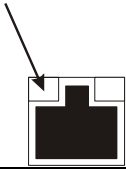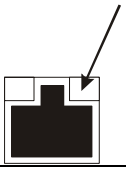
Figure 1-4. Rear Panel and Ports

Table 1-5. LAN Port (RJ45) LED Indicators

Indicator	Definition
LAN Speed LED	This LED is the LAN speed indicator. • **Steady amber** indicates the LAN is operating at 100 Mbps LAN speed. • **Off** indicates the LAN is operating at 10 Mbps LAN speed.
Link LED	This LED is the activity/link indicator. • **Steady green** indicates a valid LAN link. • **Flashing green** indicates there is LAN activity.

Applying Power to the HP Server

Powering Up the Server

1. Turn on power to the monitor connected to the HP Server.

   Turning on the monitor first ensures that video output auto-configures properly as the server boots up.

2. Press the power button on the front control panel. See Figure 1-1.

   When you press the power button, the server powers up and loads the operating system. The system runs a set of power-on self tests (POST) during this process. For details refer to Chapter 6, "Troubleshooting."

Powering Down the Server

1. Log off all users and, if necessary, back up files.

   o Schedule the power down for a time when the server being down will affect the fewest users.

   o If you will be performing a hardware or software upgrade, ensure the server's data has been backed up.

   o Follow instructions in your network operating system (NOS) documentation to shut down all networking software and applications.

WARNING	The power supply will continue to provide standby current to the HP Server until the power cable is disconnected from the rear panel.

2. Press the power button on the HP Server's control panel when prompted by the operating system.

   Normally this completes the power-down procedure.

Connecting Power to Multiple-Server Configurations

The HP Server temporarily draws a large "inrush current" when first connected to an AC power source. The inrush current is much greater than the server's normal operating current and generally, the AC power source can handle the normal inrush current.

However, if you install several HP Servers on one circuit, precautions are necessary. If there is a power failure and power is then restored, all the servers immediately begin to draw inrush current at the same time. If the circuit breakers on the incoming power line have insufficient capability, the breaker may trip and thus prevent the servers from powering up.

When preparing your site for installation, allow for the additional inrush current. Refer to "Power Supply Requirements" in Chapter 9, "Specifications."

Sleep States (ACPI)

The HP Server supports the ACPI (Advanced Configuration and Power Interface) standard, which is a key component of a NOS's directed power management. The supported features are only available when an ACPI-compliant NOS is installed on the HP Server. The term "sleep state" refers to any of several reduced power consumption states in which normal NOS activity has ceased.

The HP Server supports several sleep states. One of these is "standby" or "suspend" sleep state, which has a short wake-up time. In this sleep state, the server appears to be off – the monitor appears blank and there is no CD-ROM or SCSI hard drive activity, however, the front panel power LED flashes slowly and the fans continue to operate.

The HP Server has another sleep state with a slower wake-up time, sometimes referred to as "hibernate" by various operating systems. In this sleep state, the server appears to be off as described earlier, but the fans and the front panel power LED are also turned off. The unique feature of this sleep state (and the reason for its slower wake-up time) is that information about the server's NOS state (open applications, screens, and so on) is saved to disk before the server is placed in the sleep state. Upon wake-up, this information must be restored from the disk. This method of restoring the server's operation is much faster than a complete rebooting of the server. It still requires running all the start-up self-tests before starting the NOS, but loading the NOS and all the previously opened applications is much faster.

The HP Server supports certain types of system activity, which is used as wake-up events from these sleep states. These wake-up events can be generated from the power button, LAN activity, and scheduled events.

NOTE	The HP Server's power management policies (transitions between various power states) and the user options are specific to the particular ACPI-compliant NOS installed on the server. If your NOS is ACPI-compliant, refer to the power management features in the instructions provided for more information.

The HP Server's power button can be configured to initiate a graceful shutdown of the NOS rather than an immediate shutdown of the power supply. The power button configurations are dependent on the user interface provided by the ACPI-compliant NOS. While power management is under the control of the ACPI-compliant NOS, the HP Server's power button is capable of an override in case of a non-responsive NOS.

NOTE	The HP Server power button will force a power-down without waiting for the NOS to gracefully shut down the server, if the power button is pressed and held more than four seconds.

CAUTION	If the power button override is used, there is a strong possibility that data will be corrupted or lost.

2 External Connectors

Unless otherwise noted, the following features apply to all models. Some features are factory installed; others are optional.

Mini-DIN (PS/2) for Mouse and Keyboard
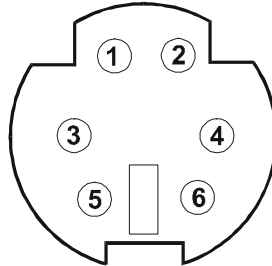
Pin Number	Signal Description
1	Data signal
2	Not used
3	Ground
4	Power (+5 V dc)
5	Clock signal
6	Not used

Serial Port
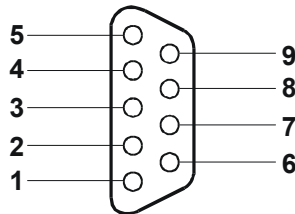
Pin Number	Signal Description
1	Data carrier detect
2	Receive data
3	Transmit data
4	Data term ready
5	Signal ground
6	Data set ready
7	Request to send
8	Clear to send
9	Ring indicator

Parallel Port
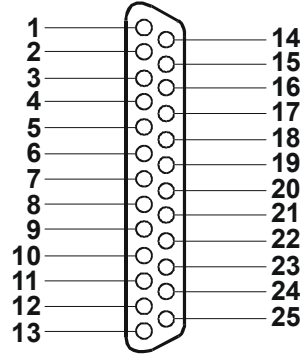
Pin Number	Signal Description	Pin Number	Signal Description
1	Strobe5	10	Acknowledge[b]
2	Data bit 06	11	Busy
3	Data bit 1[a]	12	Paper end
4	Data bit 2[a]	13	Select
5	Data bit 3[a]	14	Auto line feed[b]
6	Data bit 4[a]	15	Error1
7	Data bit 5[a]	16	Initialize printer[b]
8	Data bit 6[a]	17	Select in[b]
9	Data bit 7[a]	18-25	Signal ground

a. All data bits are sent to a printer in an 8-bit parallel format.

b. The signal is active low.

USB
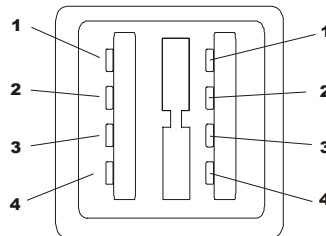
Pin Number	Signal Description
1	VBUS
2	D+
3	D-
4	GND

NOTE   Use of the USB port is supported for printers, scanners, and external modems.

Standard Video

The built-in video uses the standard 15-pin analog display pinout configuration. The pinouts for your monitor may vary. For the pinouts for your monitor, refer to the manual provided with your monitor.
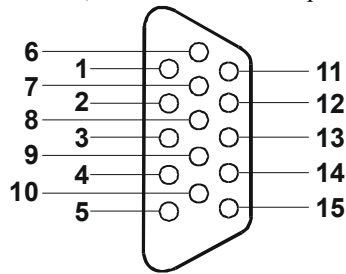
Pin	Function	Pin	Function	Pin	Function
1	Red	6	Red return (ground)	11	Monitor ID bit 0
2	Green	7	Green return (ground)	12	Monitor ID bit 1
3	Blue	8	Blue return (ground)	13	Horizontal sync (+)
4	Monitor ID bit 2	9	Key (no pin)	14	Vertical sync (-)
5	Monitor self test (ground)	10	Sync return (ground)	15	Not used

Standard SCSI
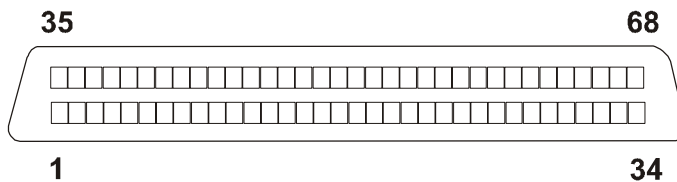
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	S1 (+DB 12)	18	S18 (TERMPWR)	35	S35 (-DB 12)	52	S52 (TERMPWR)
2	S2 (-DB 13)	19	S19 (RESERVED)	36	S36 (-DB 13)	53	S53 (RESERVED)
3	S3 (+DB 14)	20	S20	37	S37 (-DB 14)	54	S54
4	S4 (+DB 15)	21	S21 (+ATN)	38	S38 (-DB 15)	55	S55 (-ATN)
5	S5 (+DB P1)	22	S22	39	S39 (-DB P1)	56	S56
6	S6 (+DB 0)	23	S23 (+BSY)	40	S40 (-DB 0)	57	S57 (-BSY)
7	S7 (+DB 1)	24	S24 (+ACK)	41	S41 (-DB 1)	58	S58 (-ACK)
8	S8 (+DB 2)	25	S25 (+RST)	42	S42 (-DB 2)	59	S59 (-RST)
9	S9 (DB 3)	26	S26 (+MSG)	43	S43 (-DB 3)	60	S60 (-MSG)
10	S10 (+DB 4)	27	S27 (+SEL)	44	S44 (-DB 4)	61	S61 (-SEL)
11	S11 (+DB 5)	28	S28 (+C/D)	45	S45 (-DB 5)	62	S62 (-C/D)
12	S12 (+DB 6)	29	S29 (+REQ)	46	S46 (-DB 6)	63	S63 (-REQ)
13	S13 (+DB 7)	30	S30 (+I/O)	47	S47 (-DB 7)	64	S64 (-I/O)
14	S14 (+DB P)	31	S31 (+DB 8)	48	S48 (-DB P)	65	S65 (-DB 8)
15	S15	32	S32 (+DB 9)	49	S49	66	S66 (-DB 9)
16	S16 (DIFFSENS)	33	S33 (DB 10)	50	S50	67	S67 (-DB 10)
17	S17 (TERMPWR)	34	S34 (DB 11)	51	S51 (TERMPWR)	68	S68 (-DB 11)

Standard LAN
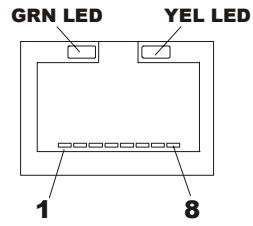
Pin Number	Signal Description
1	Data signal
2	Not used
3	Ground
4	Power (+5 V dc)
5	Clock signal
6-8	Not used

3 Installing and Configuring

Opening and Closing the HP Server tc3100

This section describes how to open and close the front bezel, lower bezel, and side panel of the HP Server tc3100.

WARNING	Before opening the server, always disconnect the power cord and unplug cables. Disconnect the power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages.
	Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist strap contacts your skin.

Figure 3-1 shows the HP Server tc3100 with SCSI cold swap hard drives. The tc3100 is also available with SCSI hot swap hard drives.

- The key lock, power button, and system and LAN status indicators are located within the front upper bezel. See Figure 3-2.

- The SCSI hard drives are accessible from the front lower bezel. See Figure 3-3.

- The system board modules, power supply, fan assembly, and PCI cards are accessible from the side panel. See Figure 3-4.
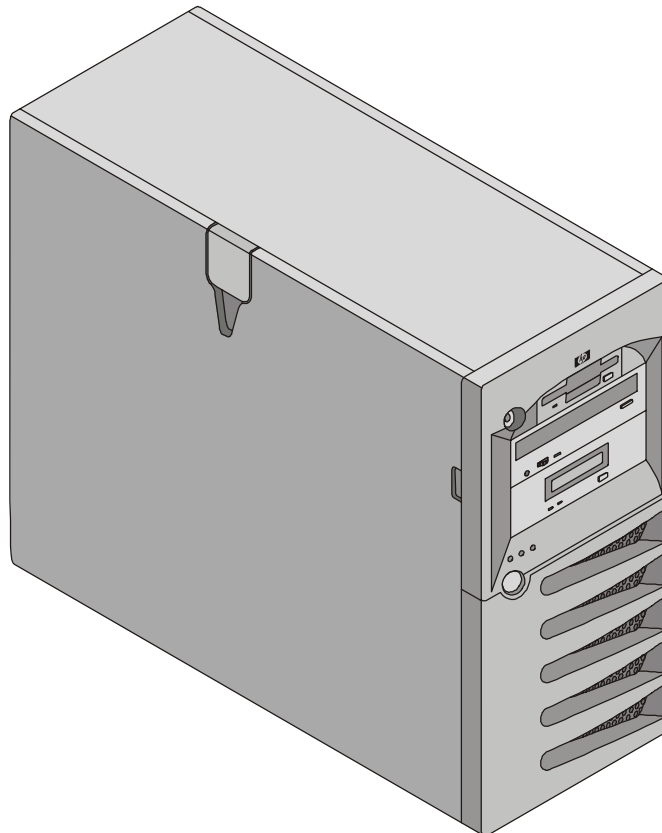
Figure 3-1. HP Server tc3100 Enclosure

Opening the Upper Bezel

You need to open the upper bezel to remove and replace the flexible disk drive and CD-ROM, or add a tape device.

- If you are installing or removing SCSI cold swap hard drives, you must open the upper bezel to open the lower bezel.

- If you are installing hardware options, you need only unlock the front bezel; the bezel does not have to be open. The hardware options include accessory boards, DIMMs, and an additional processor, which are accessed through the side panel.

1. Power off the server and disconnect all power cords and any telecommunications cables.

2. Unlock the upper bezel.

3. Hold the bezel at the notch on the side panel and swing the bezel open to the right. See Figure 3-2.
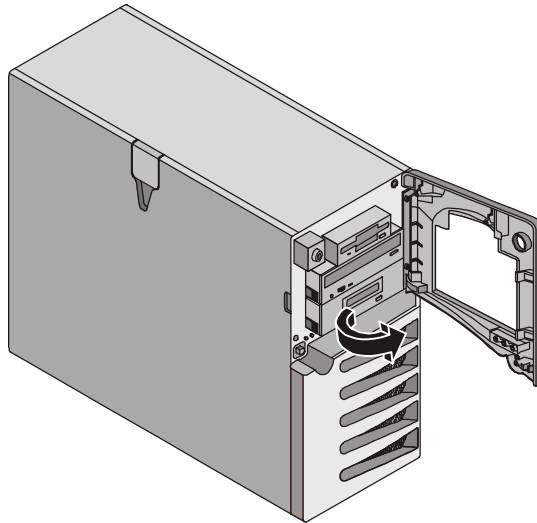
Figure 3-2. Upper Bezel (Open)

Opening the Lower Bezel (Cold Swap Model)

The only reason to open the lower bezel is to access the SCSI cold swap hard drives.

1. Power off the server and disconnect all power cords and any telecommunications cables.

2. Open the upper bezel.

3. Press down on the two tabs at the top of the lower bezel, pull the bezel toward you, and lower the door. See Figure 3-3.
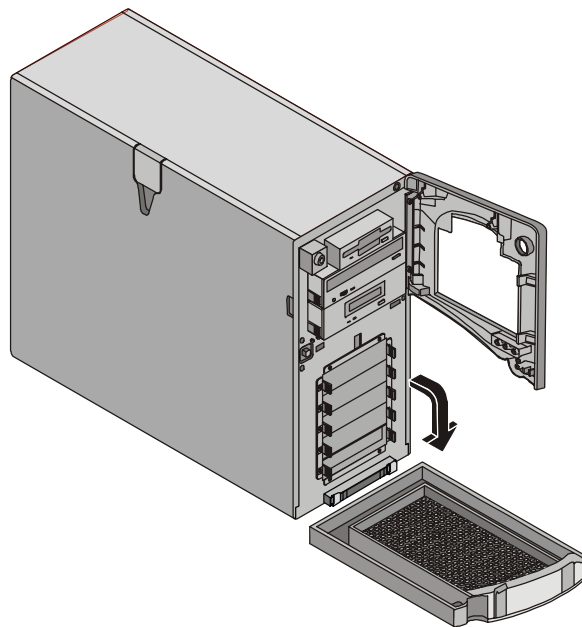
Figure 3-3. Lower Bezel (Open)

Opening the Side Panel

The power supply and fan can be installed and removed through the side panel. The user can also access the CPU system board, memory DIMMs, and all SCSI and IDE power cords.

1. Power off the server and disconnect all power cords and any telecommunications cables.

2. Unlock the upper bezel.

3. Lift the latch and open the panel. See Figure 3-4.
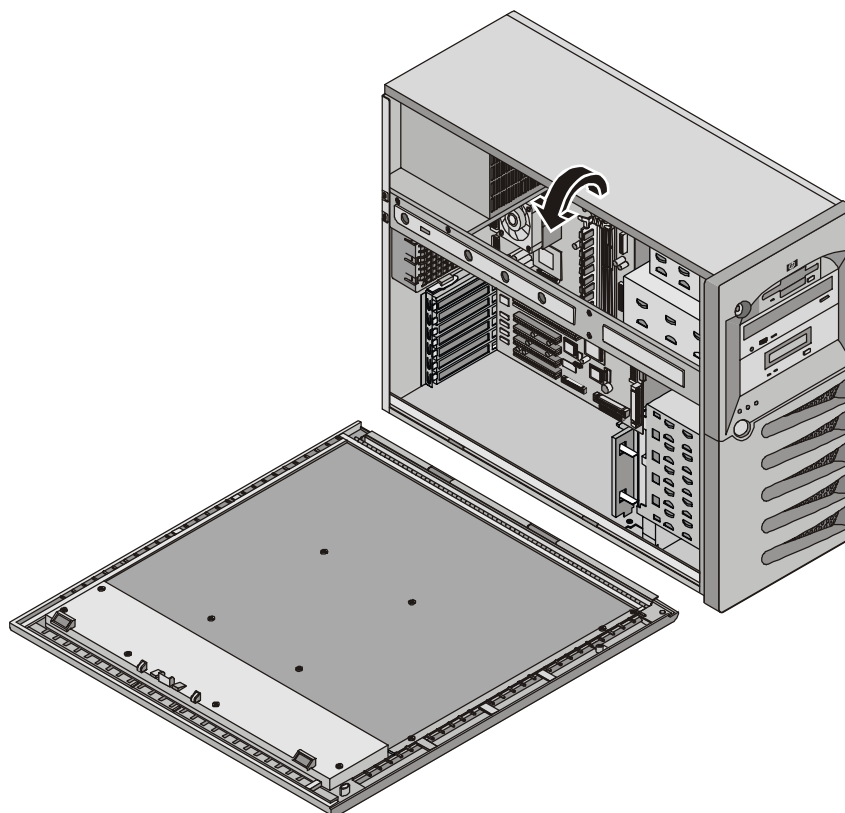
Figure 3-4. Side Panel (Open)

4. To remove the panel, raise the panel up and out of its track.

Mass Storage

The HP Server tc3100 comes standard with an IDE CD-ROM and a flexible disk drive with some configuration of SCSI hard disk drives and an optional SCSI tape backup drive. The internal mass storage can hold up to five SCSI hard drives with cabling provided.

This section describes how to install the internal mass storage devices, including the internal SCSI hot swap hard drives and the optional tape backup (DAT) drive.

Guidelines

- General Guidelines

  o Use care when unpacking and handling the disk drives.

    The hard disk drives are very susceptible to mechanical shock and can be easily damaged by a drop as short as one-quarter of an inch. If the drop would crack an egg, it will damage the drive.

  o Do not stack drives.

  o Do not use high voltage differential (HVD) SCSI devices on any of the SCSI channels or damage will occur. Use only Single-Ended (SE) or Low-Voltage Differential (LVD) devices.

  o The server is internally limited to 5 hard disk drives.

    The flexible disk drive and CD-ROM drive, which are standard on all models of the HP Server tc3100, occupy shelves 8 and 7 respectively. See Figure 3-5 and Figure 3-6.

  o If a backup tape drive is used, it occupies shelf 6, leaving five 3.5-inch devices available for shelves 1-5, and at least one is required for the boot drive.

- IDE Devices

  o The embedded IDE controller is an Enhanced-IDE single channel controller. Refer to "System Board Layout" in Chapter 9, "Specifications."

  o The IDE CD-ROM uses only one connector on the cable from the IDE channel (IDE2) connector.

- SCSI Device Selection

  o Ensure the SCSI devices you install in *both* non-hot swap and hot swap-drive bays do not have terminations installed. The non-hot swap SCSI drives are connected to a terminated cable and the hot swap cage provides the termination for any unused slots in the cage.

  o Use only HP LVD SCSI 3.5 inch hard disk drives for the cold swap and hot swap drive cages.

    The HP cold swap and hot swap drives come set for LVD SCSI operation and without device ID or termination. Do not change these settings.

  o Use the supported 5.25 inch SCSI devices for the common tray (5.25") shelves.

    The available space in the 5.25" common tray shelves supports two half-height (1.6 inch) devices. You can order HP mounting kits for removable media devices. You may use narrow/wide SCSI adapters on these devices.

  o The embedded dual-channel Ultra-3 SCSI controller includes connectors for SCSI channels A and B.

  o Channel A can be used for internal tape backup or to connect to external mass storage devices or to external backup tape devices. Channel A is connected to the optional internal tape drive.

    An additional cable kit is required for external mass storage devices or connecting the optional tape backup drive. Refer to the appropriate topic later in this chapter.

  o Channel B typically is used for cabling the factory installed hard disk drives, which may consists of five SCSI drives (including an optional tape drive). The standard SCSI cable has five 68-pin, high-density connectors for the SCSI devices and has a terminator on the end of the cable.

- o The optional HP supplied tape drive comes with a 50-to-68-pin adapter to connect to the SCSI connector on the cable used to connect the tape drive.
- SCSI Drive Addressing
  - o The drives in the cold swap and hot swap cage are automatically assigned SCSI addresses by the HP Server.
  - o The non-hot swap SCSI devices use SCSI IDs from 0 through 15, with the following restrictions:
    - ➢ Narrow SCSI devices must be addressed 0 through 6.
    - ➢ Wide SCSI devices may be addressed 0 through 15, except for ID 7, which is held by the SCSI controller.

    The non-hot swap SCSI devices are all connected to the same cable, which is terminated and connected to one SCSI controller. Each SCSI device connected to the non-hot swap device connector must have a unique address.
  - o The cold swap SCSI back plane is hard wired for SCSI 01238 from bay 1 (bottom) to bay 5 (uppermost cold swap drive bay).
- SCSI Device Installation Order

| NOTE | The boot drive must be in the bottom slot. |

- o Add cold swap hard drives starting from the bottom drive cage in the HP Server tc3100.
- o Add hot swap hard drives starting from the bottom of the drive cage in the HP Server tc3100.

  If you are using one or more filler panels, insert them at the top of the cage. These configurations may use filler panels to close up the front of the cold swap or hot swap mass storage cage. If there are gaps in the cage, the drives may not receive the proper ventilation and could suffer thermal damage.
- Filler Panels
  - o Ensure all empty slots in the cold swap or hot swap drive cage have filler panels inserted to ensure proper airflow.

    If there are fewer drives than the hot swap drive cage supports, a 1-inch filler panel must be inserted in each empty disk location. The filler panels ensure the drive cage has the proper ventilation and airflow.

Boot Priority

This section details the HP Server's boot order by highest to lowest priority. The embedded SCSI controller consists of two channels, A and B. Channel A typically is used to control the external SCSI devices. Channel B typically is used to control the SCSI hard drives (5) and optional tape back-up drive. On each SCSI channel, the controller scans for a boot device starting at device ID 0 and works through the ID numbers. The server's embedded controller is always SCSI ID 7. If an optional SCSI backup tape drive is used it takes address ID 4.

The server's boot order should be considered when selecting a boot device. This is especially important if you are installing a board that requires a higher priority in the boot order. The board's boot priority is set by its slot location in the boot order.

By default the server searches for boot devices in this order:

1. IDE CD-ROM drive
2. Flexible disk drive
3. Embedded SCSI A channel (external SCSI Drives)
4. Embedded SCSI B channel (SCSI Devices)
5. PCI slot 6

6.   PCI slot 5

7.   PCI slot 4

8.   PCI slot 3

9.   PCI slot 2

10. PCI slot 1

11. Embedded LAN

For information about booting off of a hard disk connected to an accessory board, see "Installing a Disk Array Controller Board" later in this chapter.

| NOTE | The boot order can be changed using the server's (BIOS) Setup Utility and the SCSI Select Utility. See "BIOS Setup Utility" later in this chapter. |

Installed Mass Storage Devices

Table 3-1 lists the number and types of mass storage devices that may be installed in the HP Server tc3100.

Table 3-1. Mass Storage Device Types

Interface Types	Max Number of Devices	Installed Devices and Addresses
Flexible disk drive	1	Factory installed flexible disk
IDE-2	1	Factory installed CD-ROM drive (IDE connector)
Ultra SCSI Adapter	1* (optional)	Optional SCSI Tape Backup Drive (address = ID 4)
Ultra-3 SCSI Channel A	up to 15 **	Control of up to 15 external SCSI devices or internal backup tape.
Ultra-3 SCSI Channel B	up to 5**	Up to 5 SCSI hard disk drives (addresses = ID 0, 1, 2, 3, 8) Embedded SCSI controller (address = ID 7)

 * A 50-to-68-pin SCSI adapter is provided with the HP tape drive.

 ** Both SCSI channels (A and B) can each support up to 15 devices; however, there are only enough internal storage shelves for five hard drives and one optional tape backup device. Channel A is used to control external SCSI devices or internal backup tape.

Installing Hard Disk Drives

| WARNING | Always wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist strap contacts your skin.

 The flexible disk, CD-ROM, and optional disk do not have protective shields; they are ESD sensitive. Caution must be taken when removing them to avoid electrical shock. Install and remove connectors carefully, and avoid displacing any of the pins. |

Flexible Disk Drive

Use the following steps to install a flexible disk drive (FDD):

1. If the server is operating, log off all users, back up files, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

3. Open the upper bezel and side panel.

4. Press the two latches of the drive inward and slide the drive out far enough to expose the connectors.

5. Disconnect the power and signal cable connectors.

6. Hold the disk by its sides and gently slide the disk from the chassis. See Figure 3-5.
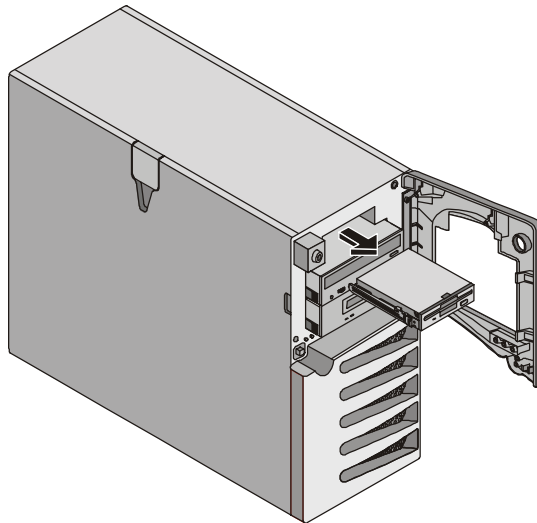
Figure 3-5. Removing Flexible Disk Drive

7. Connect the power and signal cable to the new drive.

8. Gently slide the drive into the available opening until the eject mechanism clicks.

   Watch the cable inside the side panel so it does not get pinched.

9. Close the upper bezel and side panel, and replace the external cables and power cord.

10. Power up the server and return it to normal operation.

CD-Rom or Optional Tape Disk Drive

Use the following steps to install a CD-ROM or optional tape disk drive:

1. If the server is operating, log off all users, back up files, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

3. Open the upper bezel and side panel.

4. Disconnect the power and signal cable connector from inside the side panel.

5. Press the two latches of the drive inward and, holding the disk by its sides, gently slide the drive from the chassis. See Figure 3-6.
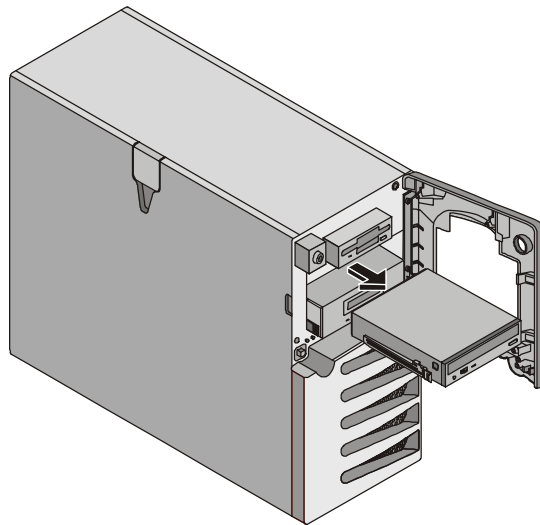
Figure 3-6. Removing a Hard Disk Drive

6. Gently slide the new drive into the available opening until the eject mechanism clicks.

7. Connect the power and signal cable to the new drive.

8. Close the upper bezel and side panel, and replace the external cables and power cord.

9. Power up the server and return it to normal operation.

NOTE	If you will not be replacing the drive, replace the disk with a filler panel to ensure the integrity of the cooling system.

Installing Optional SCSI Accessory Cable

The optional SCSI accessory cable (P/N P1773A) is used to connect the optional tape drive, which will separate the slower tape drive from the faster Ultra-3 SCSI drives. Refer to Figure 3-7 when installing the optional SCSI accessory cable into the Channel A connector and cabling the existing cable and channel B cable to the SCSI disk drives.
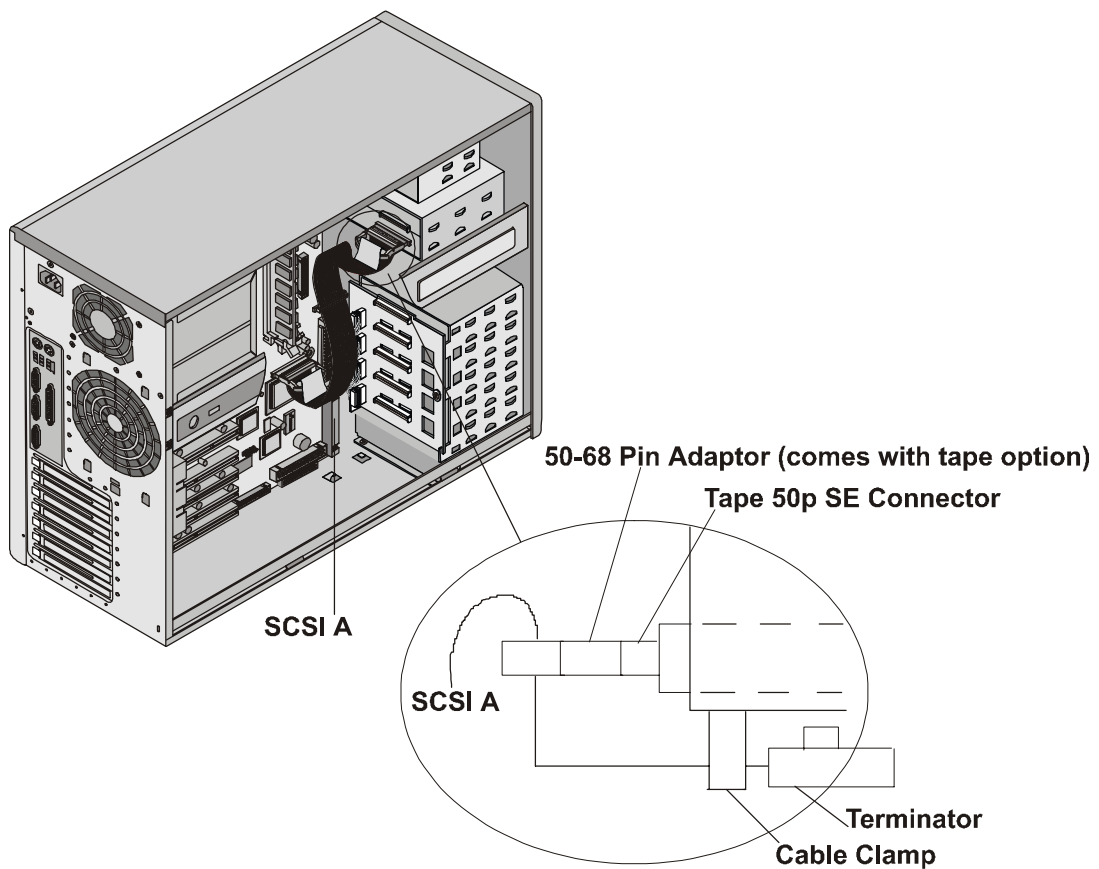
Figure 3-7. Installing Additional Cabling

Installing Optional Internal to External SCSI Cable

The HP Server tc3100 can be configured to extend one of its SCSI channels (channel A) to an external SCSI connector. This allows you to connect additional external mass storage devices to the second channel of the server's embedded SCSI controller. It requires a second SCSI cable, HP Server tc3100 Internal/External SCSI Cable Kit, PN: P1774A.

1. Remove the IO locking bracket. See Figure 3-8.

   a. Lift the bracket up.

   b. Rotate it toward you and slide out.
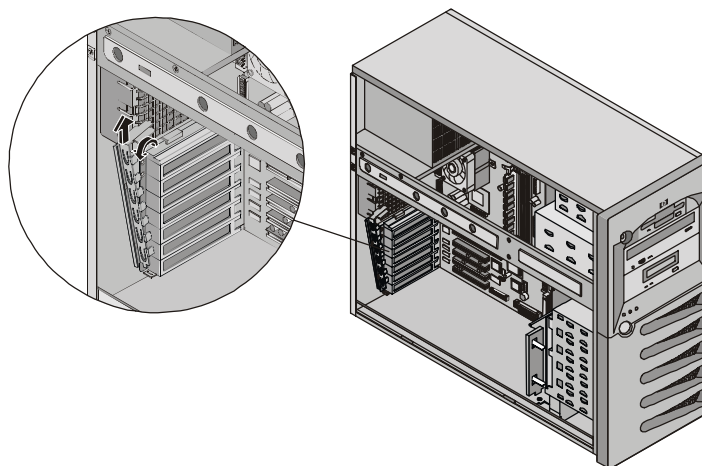
Figure 3-8. Removing IO Locking Bracket

2. Push the top PCI slot cover from the rear of the chassis to remove it.

3. Connect one end to the free SCSI connector (Channel A) on the system board. See Figure 3-9.

4. Route the cable straight back to the open slot and clip it in place at the top.

External SCSI Connection   **SCSI A Connector**
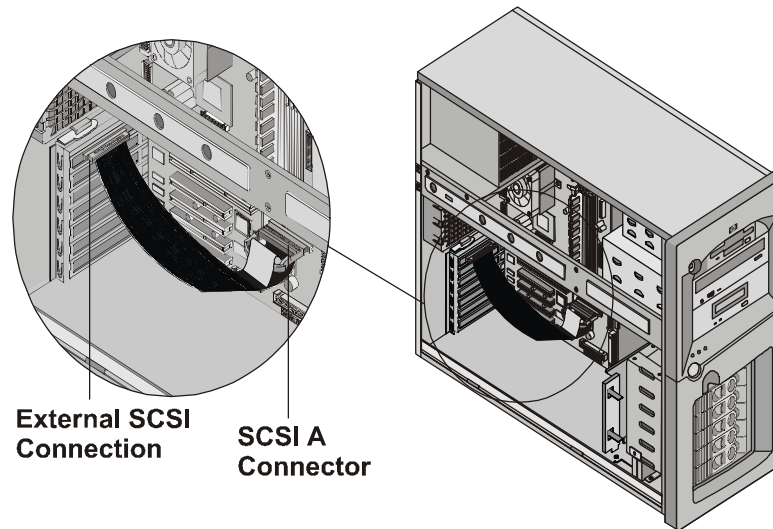
Figure 3-9. External SCSI Cable

5. Replace the IO locking bracket and rotate it to close.

Installing Cold Swap Hard Drives

Use the following steps to install cold swap hard drives:

1. If the server is operating, log off all users, back up files, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING	The power supply will continue to provide standby current to the HP Server until the power cord is disconnected.

CAUTION	Protect the drive from static electricity by leaving it in its anti-static bag until you are ready to install it. Before handling the drive, touch any unpainted metal surface to discharge static electricity. When you remove the drive from the anti-static bag, handle it only by the frame.
	Do not touch the electrical components. Place the drive on the anti-static bag whenever you set it down.

3. Using both hands, grasp the ejector arms of the filler panel in the desired drive slot and press inward while pulling the filler panel towards you.

4. Slide the new drive into the open slot until you feel resistance, and then press firmly until the drive is fully seated into the connector on the back plane and the latches have fully engaged the chassis.

5. Verify that the drive is flush with the other drives. If the drive is not flush, it is not seated properly in the drive slot. Remove the drive and repeat Steps 4 and 5.

Removing Cold Swap Hard Drives

1. If the server is operating, log off all users, back up files, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING	The power supply will continue to provide standby current to the HP Server until the power cord is disconnected.

3. Using both hands, grasp the ejector arms of the drive to be removed and press inward while pulling the drive out towards you.

4. Use your hand to support the bottom of the drive, while you slowly pull the drive straight out. See Figure 3-10.

   Do not allow the drive to fall.
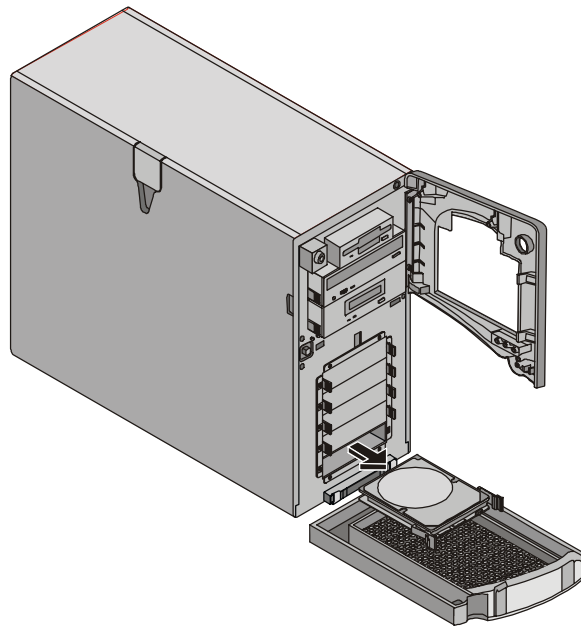
Figure 3-10. Removing Cold Swap Hard Drive

5. Place the drive in an electrostatic protected container.

   Do not stack drives.

NOTE	If you are not replacing the drive, place a filler panel in the drive slot. Operating the HP Server without filler panels in empty SCSI drive slots may cause the HP Server to suffer thermal damage.

Installing Hot Swap Hard Drives

Use the following steps to install hot swap hard drives:

CAUTION	Protect the drive from static electricity by leaving it in its anti-static bag until you are ready to install it. Before handling the drive, touch any unpainted metal surface to discharge static electricity. When you remove the drive from the anti-static bag, handle it only by the frame.
	Do not touch the electrical components. Place the drive on the anti-static bag whenever you set it down.

1. Unlock the hot swap mass storage cage before attempting to remove the drive filler panel.

CAUTION	To prevent snapping off the handle, do not use extreme force when opening it. Open the handle until you feel resistance.

2. Remove any filler panels in the desired drive slot.

   a. Press in the locking latch and insert your finger.

   b. Using your finger, pull the filler panel straight out. See Figure 3-11.
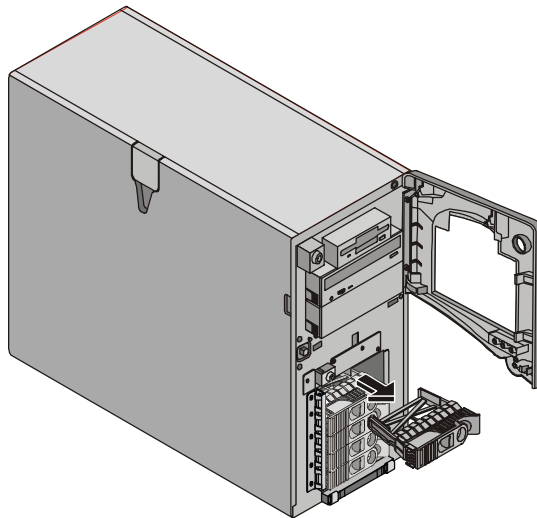
Figure 3-11. Removing Filler Panel

3. Open the drive module by pressing in on the locking latch at the end of the drive ejector handle and pulling the handle open.

4. Gently slide the new drive module into the drive slot and stop when you feel resistance.

5. Verify the hooks behind the pivot end of the handle engages the hole in the edge of the cage.

6. Press the ejector handle in until you feel the latch click into place.

   Closing the ejector handle engages the drive with the electrical connector in the hot swap drive cage and seats the drive.

7. If the drive is unseated in the cage after closing the ejector handle, remove the drive and insert it once again.

   The handle was probably not pulled out far enough, and the locking latch failed to engage the hot swap mass storage cage.

Removing Hot Swap Hard Drives

CAUTION	*You must remove the drive slowly to ensure the drive heads are parked prior to removal.* Ensure you follow these instructions carefully to prevent handling damage, such as head slaps or head actuator unlocking.

1. Unlock the hot swap mass storage cage before attempting to remove the drive.

2. To unlock the drive, push the locking latch in and then pull the ejector handle toward you.

3. Gently pull the drive straight out to disengage the power connection.

4. Wait about 30 seconds for the drive to stop spinning and the drive heads to park.

CAUTION	*You must remove the drive slowly about an inch to disconnect from the back plane and wait 30 seconds for the drive to stop spinning to ensure the drive heads are parked prior to removal.* Ensure you follow these instructions carefully to prevent handling damage, such as head slaps or head actuator unlocking.

5. Use your hand to support the bottom of the drive, while you slowly pull the drive straight out. Do not allow the drive to fall. See Figure 3-12.
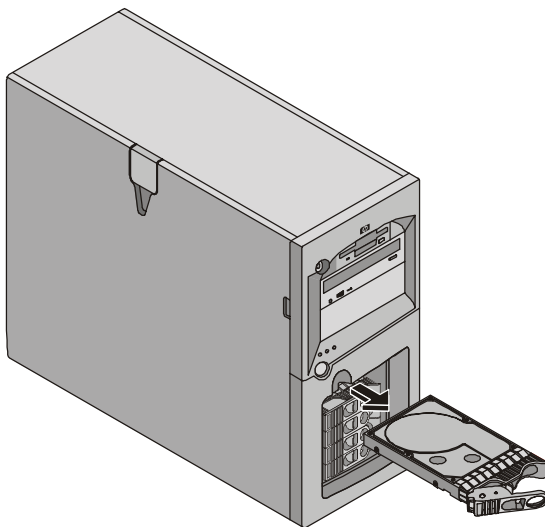
Figure 3-12. Removing Hot Swap Hard Drive

6. Place the drive in an electrostatic protected container.

   Do not stack drives.

Memory Modules

The HP Server's main memory is implemented using four memory slots on the system board which support up to 4 GB (1 GB x 4) of memory. The server uses only 3.3V, 168-pin, 133 MHz, buffered, ECC, SDRAM DIMMs and ships with at least one 128 MB DIMM. The embedded video controller is provided with 8 MB standard video memory and cannot be upgraded.

NOTE	Use only PC 133 (133 MHz), buffered, ECC, SDRAM DIMMs acquired from Hewlett-Packard. The EDO DIMMs and PC 100 SDRAM DIMMs from earlier HP Server models will fit into the DIMM slots in the HP Server tc3100, but the EDO DIMMs and PC 100 SDRAM will not function properly and are not supported.

To ensure you have the correct DIMMs before installation, refer to one of the following for a list of qualified DIMMs:

- Technical Reference Label inside the HP Server's side panel

- Information Assistant on the HP Server Online Documentation CD-ROM

- HP Customer Service

CAUTION	Use an anti static service kit (3M 8501/8502/8503 or equivalent). This kit includes a static-dissipating work surface, a chassis clip lead, and a wrist strap.

Guidelines

- The HP Server tc3100 uses only PC 133 (133 MHz) buffered, ECC, SDRAM DIMMs, which are electrically different from the EDO and PC100 SDRAM memory modules used in previous HP Server models.

- DIMMs sizes supported are 128 MB, 256 MB, 512 MB, or 1 GB in any combination.

- Supported memory capacity ranges from 128 MB to 4 GB maximum (1 GB in each of the 4 DIMM slots).

- DIMM sizes may be mixed on the system board and may be loaded in any order. However, HP recommends starting at slot 3 and filling the slots in order with the largest size first: 3, 2, 1, and 0.

- Open slots between DIMMs are permitted.

- When handling DIMMs, observe anti-static precautions to avoid damage.

Installing Additional DIMMs

1. If the server is operating, log off all users, back up files, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING	The power supply will continue to provide standby current to the HP Server until the power cord is disconnected.

3. Open the side panel.

NOTE	It is not necessary to remove the system board from the HP Server to install the additional DIMM memory.

4. Choose a DIMM slot for the desired DIMM. See Figure 3-13.

DIMM Slots 0 1 2 3
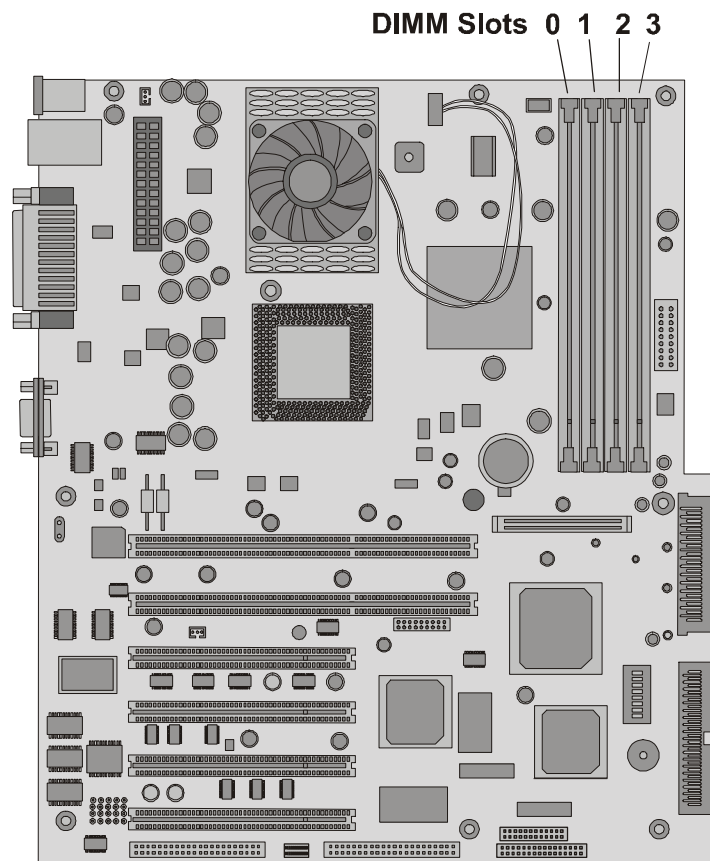
Figure 3-13. DIMM Locations on System Board

5. Spread the two retaining latches outward to accept the DIMM.

6. Remove the HP DIMM from its protective container, handling the module by its edges.

   If you must lay it down, place it on an anti-static mat.

7. Align the notches on the new DIMM with the keys on the DIMM slot. See Figure 3-14.

Notches

Keys

Retaining Latches

DIMM Slot
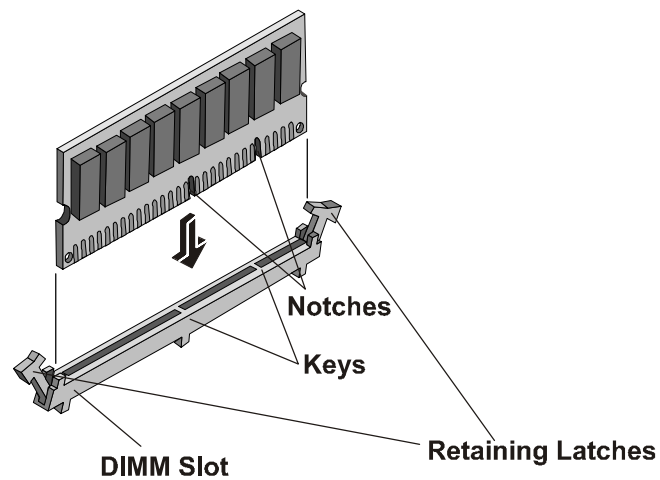
Figure 3-14. DIMM to Slot Alignment

8. Hold the DIMM at 90 degrees to the system board and press the DIMM firmly and evenly into the slot until the retaining latches close. See 3-15.

It is important to hold the DIMM firmly with both hands and use even pressure so as not to bend or break the DIMM connector during installation. If the latches do not close, the DIMM is not inserted correctly.
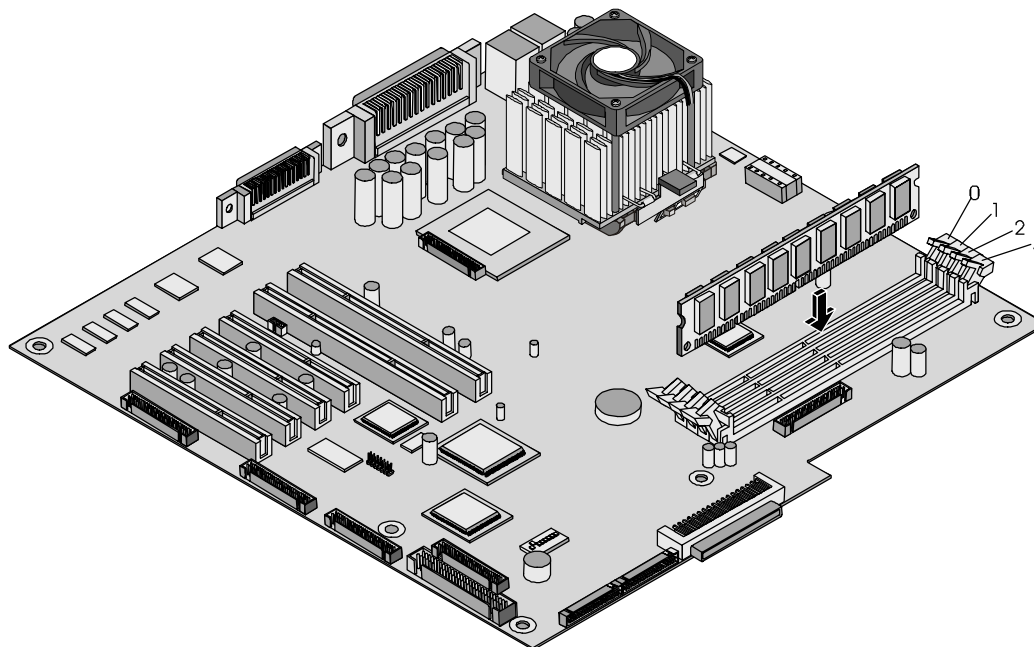
Figure 3-15. DIMM Insertion

9. Close the side panel.

10. Reconnect the power cord and all external cables.

11. Power up the server and return it to normal operation.

NOTE	If the DIMMs are not seated properly you may get a blank screen.

Removing DIMMs

You may need to remove a DIMM module to downsize your memory configuration or to replace a defective DIMM.

Follow the steps in the preceding section, but instead of installing a DIMM, remove the DIMM.

NOTE	If you power up the HP Server when there are no DIMMs installed, the screen displays an error message or appears blank and sounds beep codes.

Processors

The HP Server tc3100 ships with at least one processor installed. Both primary and secondary processor sockets are located on the system board (primary processor socket – CPU 1. The voltage regulator modules (VRMs) are embedded in the system board. See Figure 3-16.

CAUTION	Use an anti static service kit (3M^{TM} 8501/8502/8503 or equivalent). This kit includes a static dissipating work surface, a chassis clip lead, and a wrist strap.

Guidelines

The HP Server tc3100 supports speeds of 1.13-1.40 GHz with a front side bus (FSB) speed of 133 MHz. For the most recent support information, visit the HP web site

http:/www.hp.com

and click the support button.

- Both processors must be the same type and have the same product number, which insures the same clock speed, cache size, and FSB speed.

- The processors must operate at the designated speed stated by the product type on the processor.

- Use only processor upgrade kits with the same HP product number. This ensures the processor type, clock speed, and cache size are the same.

- Install the second processor in the secondary slot (CPU 2). See Figure 3-16.
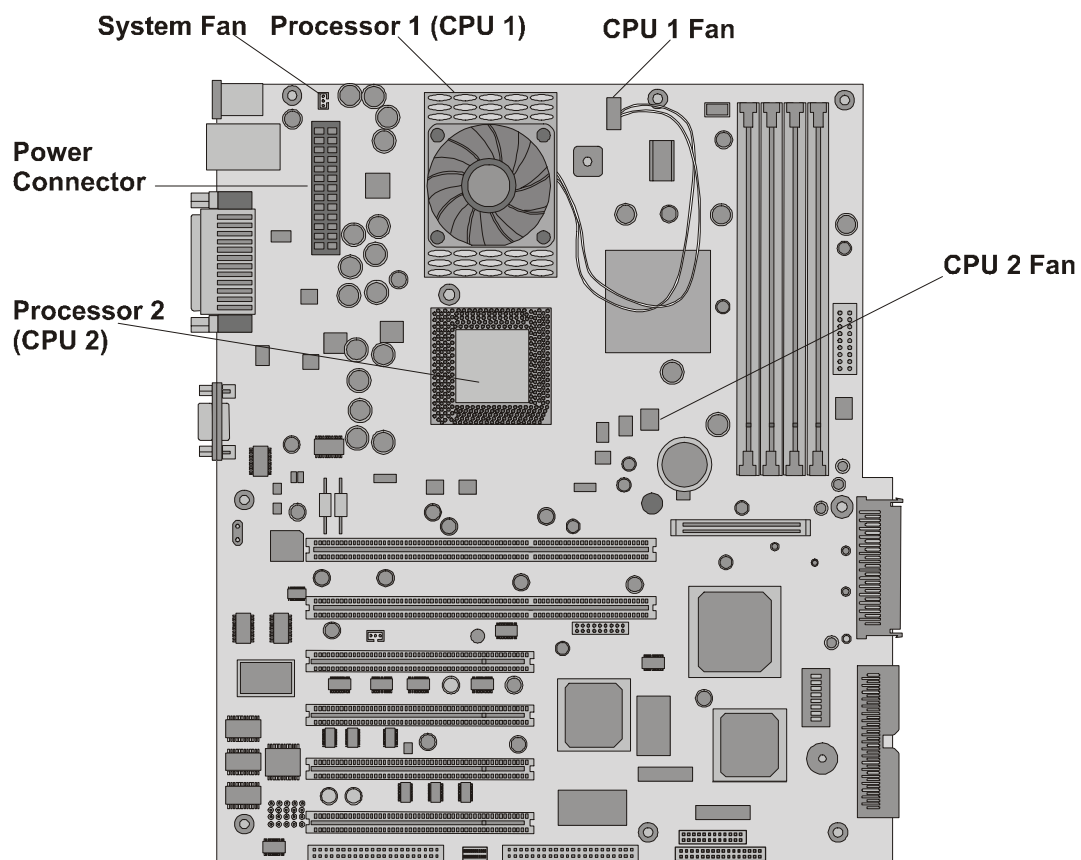
Figure 3-16. System Board (top view)

Installing a Second Processor

This section provides the instructions for installing a second processor and its heatsink on the system board. Figure 3-16 indicates the location of the primary and secondary processors.

CAUTION	Take the following precautions when installing processors:
	- Leave the processor in the anti-static bag until you are ready to install it.
	- Wear an anti-static wrist strap and use a static-dissipating work surface or grounding mat connected to the chassis when handling components.
	- Before removing a processor from the anti-static bag, touch a grounded, unpainted metal surface to discharge static electricity.

1. Unpack the processor shipping box and check the contents against its packing list.

2. Log off all users, back up files, and shut down the NOS according to the instructions in your NOS documentation.

3. Press the power switch on the HP Server control panel when prompted by the operating system.

   Normally, this completes the shutdown procedure.

WARNING	Power supplies continue to provide standby current to the HP Server until the power cord is disconnected.

4. Disconnect the AC power cord.

5. Open the side panel and lay the chassis down to gain access to the system board.

NOTE	It is not necessary to remove the system board from the server to install the second processor (CPU 2).
	If you are installing both processors, you may need to remove the power connector to the system board to have full access to the processor in the primary processor socket (CPU 1).

6. Ensure the processor speed of the second processor (CPU 2) is the same as the primary processor.

   If you are upgrading the second processor to a faster processor speed than the primary processor, the primary processor must also be changed. Both processors must have the same product number, which includes the same clock speed, cache size, and FSB speed.

   The supported processors only perform at the rated speed indicated on the processor in the HP Server.

7. Open the ZIF (Zero Insertion Force) lever to allow removal of the terminator out of the processor socket.

   To open the ZIF lever, pull the lever out away from the ZIF socket and raise it a full 90° to the system board. See Figure 3-17.

Terminator

Processor Socket

ZIF Lever
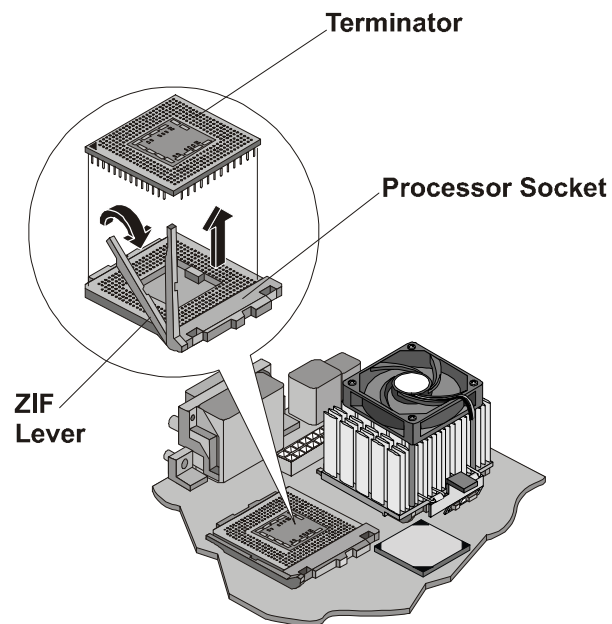
Figure 3-17. Removing the Terminator

8. Lift the terminator out of the socket and place it on an anti-static surface or in a container.

NOTE	Keep the terminator for future use. The terminator must be installed in the secondary processor socket when only one processor is used or the HP Server will not operate properly.

9. Align the second processor over the empty processor socket. See Figure 3-18.

CAUTION	Ensure you align pin-1 of the processor with pin-1 of the processor socket or pin damage will occur.

10. Insert the second processor into the socket and close the ZIF lever to fully seat the processor.

You should hear the ZIF lever click when it closes properly.

Pin 1 Marker
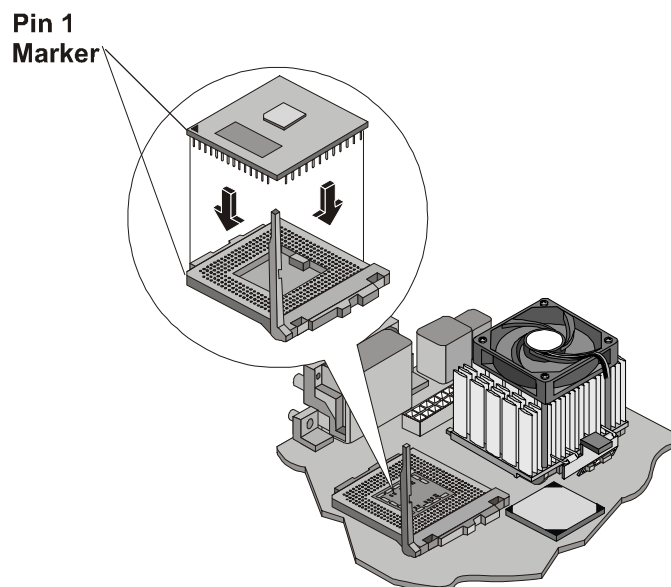
Figure 3-18. Installing Processor

Installing the Heatsink

Once the processor is installed, the cooling fan-heatsink must be installed on top of the processor. Each processor requires a heatsink, with its cooling fan attached, and a thermal interface material (grease) between the processor and the heatsink. The heatsink is mechanically connected to the processor socket with both latches, mechanically making contact with processor. HP recommends you do not reuse a heatsink.

1. Remove the heatsink-fan assembly from the shipping container and ensure you do not touch the thermal interface material on the bottom of the heatsink.

2. Ensure the latches are free and pointing away from the heatsink.

3. Position the heatsink over the second processor and:

   a. Tilt or roll it slightly to the rear of the chassis to help engage the hook latch and then connect the hook latch to the tab.

CAUTION	Take care not to move the nearby capacitors.

   b. Rotate the heatsink back, placing it squarely on top of the processor and connect the thumb latch to the tabs on the base of the processor socket on the side shown in Figure 3-19.

   The rail and guide on the heatsink bottom will help you to center the heatsink.

CAUTION	Do not apply too much force when connecting the thumb latch to the tab on the base of the processor socket, otherwise, you may damage the components on the system board.

   The thumb latches hook underneath the tabs extending from the base of the processor socket base.

   c. Ensure the ridge on the bottom of the heatsink rests between the processor and the edge of the processor socket base.
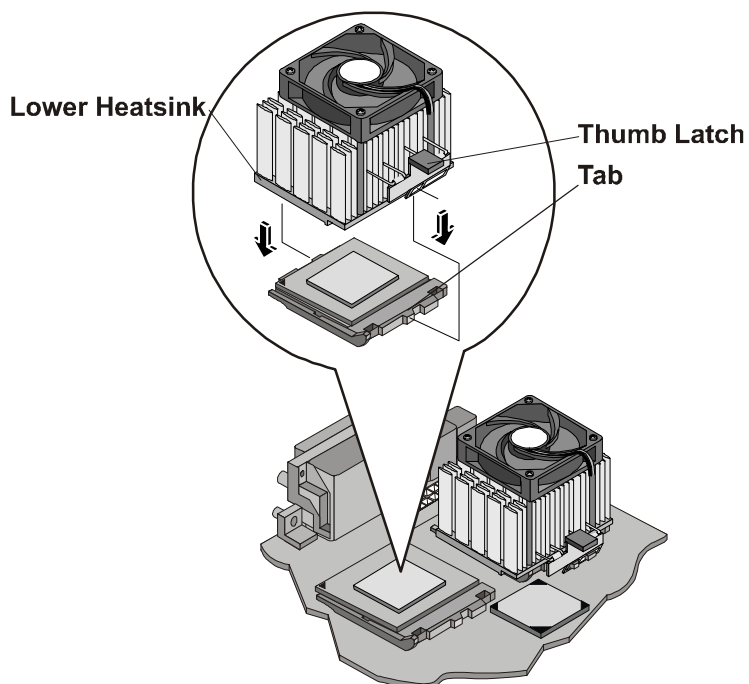
Figure 3-19. Installing Heatsink

CAUTION	Ensure you have made good contact with the processor to avoid thermal overheating. If you have not made good contact, the processor will overheat within 20 seconds of power on and will shut down, possibly causing damage to the processor.

4. Connect the heatsink's cooling fan connector to the 2nd cooling fan connector (CPU 2 Fan) on the system board. See Figure 3-19.

CAUTION	Failure to connect the cooling fan to its power connector will cause the server to shut down with no messages displayed, possibly causing damage to the processor.

NOTE	No speed switch settings are required for the supported processors in the HP Server. These processors rely on the internal settings within the processors and do not rely on the external switch settings.

5. Close the side panel.

6. Replace the external cables and power cord.

7. Power up the server and return it to normal operation.

Removing a Processor and Heatsink

Use this procedure to remove a processor and its heatsink. The heatsink and cooling fan must be removed first, before removing the processor.

CAUTION	Always wear a wrist-strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist strap contacts your skin.
	Before you touch the processor to remove it, touch a grounded, unpainted metal surface on the HP Server to discharge static electricity.

NOTE	If you need to remove the primary processor (CPU 1), you may find it necessary to remove the power and system fan connectors to access the primary processor.

1. Disconnect the cooling fan connector from its respective cooling fan connector on the system board.

2. Unhook the thumb latch on the heatsink and lift the heatsink up slightly from the processor.

3. Rotate the heatsink away from the processor toward the rear of the server, releasing the opposing latch.

4. Lift the heatsink away from the processor and out of the server.

5. Open the ZIF lever to allow removal of the processor. See Figure 3-18.

6. Grasp the processor by its edges and lift it out of the socket and place it on a static-dissipating work surface or into an anti-static bag.

If you are not replacing the processor with a new or replacement processor, you must install the terminator in the empty processor socket. See Figure 3-17.

Firmware and Software Changes

This section deals with the firmware changes provided by the *HP Server Navigator CD-ROM* and the possible reinstalling of the NOS to recognize the second processor.

Upgrading the Firmware

If your processor included a new *HP Server Navigator CD-ROM*, insert the CD into the HP Server CD-ROM drive and power on the server. Follow the instructions provided on screen to ensure the system BIOS is up-to-date. The system BIOS on the CD will be compared to the server's current BIOS, and if necessary, will indicate if the BIOS needs to be updated. For more information, see "HP Server Navigator CD-ROM" later in this chapter.

Reinstalling the NOS

You may need to reconfigure or reinstall your NOS in order to use the additional processor you have installed. If you have gone from a single-processor to dual-processor configuration, check your NOS documentation or the Readme file and Configuration Advisor utilities on the *HP Server Navigator CD-ROM*.

Accessory Boards

The system board in the HP Server tc3100 provides six PCI slots (P1 through P6), with four 32-bits slots and two 64-bit slots. All PCI slots accept full-length accessory boards.

Tested PCI Boards

For a list of tested PCI boards, check for compatibility in Configuration Assistant on the *Navigator CD-ROM* or look for the Hardware Tested Products list for the HP Server tc3100 under the Service and Support topic for the specific NOS used in the server on the HP web site at:

   http:/www.hp.com

Click the support button and then click netservers. Under Support Categories, select compatibility.

All Hewlett-Packard accessory boards comply with the U.S. National Electrical code (NFPA 70) Class 2.

For additional information, refer to the Readme file and Configuration Advisor on your *HP Server Navigator CD-ROM*. Refer to the instructions later in this chapter.

CAUTION	Some accessory board outputs may exceed U.S. National Electrical code (NFPA 70) Class 2 or limited power source limits and must use appropriate interconnecting cabling in accordance with the National Electrical Code.

Remote Control Card

The HP Server tc3100 may use the HP Server remote management card in PCI slot 6 on the system board. This card supports HP TopTools software. An I^2C connector is provided on the system board. For more information, see "HP TopTools," in Chapter 4, "Diagnostics."

Guidelines

The following sections provide guidelines for installing PCI accessory boards into the HP Server tc3100.

IRQ Settings

The HP Server uses the Plug and Play feature of the PCI board to automatically assign its resources.

Boot Priority

The server's boot order should be considered when selecting a boot device. This is especially important if you are installing a board that requires a higher priority in the boot order. The board's boot priority is set by its slot location in the boot order.

By default the server searches for boot devices in this order:

1. IDE CD-ROM drive

2. Flexible disk drive

3. Embedded SCSI A channel (external SCSI Drives)

4. Embedded SCSI B channel (SCSI Devices)

5. PCI slot 6

6. PCI slot 5

7. PCI slot 4

8. PCI slot 3

9. PCI slot 2

10. PCI slot 1

11. Embedded LAN

Using the Primary or Secondary PCI Bus

The HP Server tc3100 has a Primary and Secondary PCI bus. The two busses are peer-to-peer, which provides approximately equal performance, except when using the two 64-bit slots versus the 32-bit slots. See Table 3-2.

Table 3-2. PCI Bus Selection

PCI Slots	PCI Bus
Slots 3 through 6	Primary PCI Bus
Slots 1 and 2	Secondary PCI Bus

Installing a Disk Array Controller Board

Adding a disk array controller board provides additional fault tolerance to your internal or external mass storage devices. HP recommends installing the HP NetRAID-1M PCI board in slot 3, 4, or 5. When installing a disk array controller board, you may alter the server's boot order to allow the server to boot off one of the array's drives. This boot order can be changed under the Configuration menu of the server's (BIOS) Setup Utility and in the SCSI Configuration Utility.

Installing an Accessory Board

Use this procedure to install the accessory board.

NOTE	For information about a specific PCI board type, refer to the Readme file, Tested Products List, or Configuration Advisor on your *HP Server Navigator CD-ROM*.

1. If the server is operating, log off all users, back up files if necessary, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING	The power supply will continue to provide standby current to the HP Server until the power cord is disconnected.

3. Read the documentation included with the accessory board and follow any special instructions. PCI boards must be set to INT A on the board if jumpers are provided.

NOTE	Adding a PCI-to-PCI bridge board to the HP Server may alter the server's boot order. This boot order can be changed using the Setup Utility (press F2 during the boot process). Refer to "Boot Priority" earlier in this chapter.

4. Open the side panel.

CAUTION	Wear a wrist strap and use a static-dissipating work surface connected to the chassis when handling components. Ensure the metal of the wrist strap contacts your skin.

5. Remove any cables attached to the accessory board. If necessary, label each one to expedite re-assembly.

6. Remove the IO locking bracket. See Figure 3-20.

   a. Lift the bracket up.

   b. Rotate it toward you and slide out.
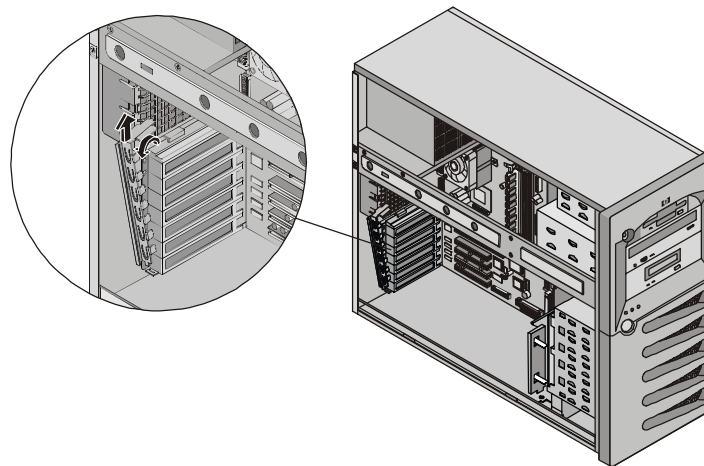
Figure 3-20. Removing IO Locking Bracket

7. Identify the accessory slot number to be used. See Figure 3-21.
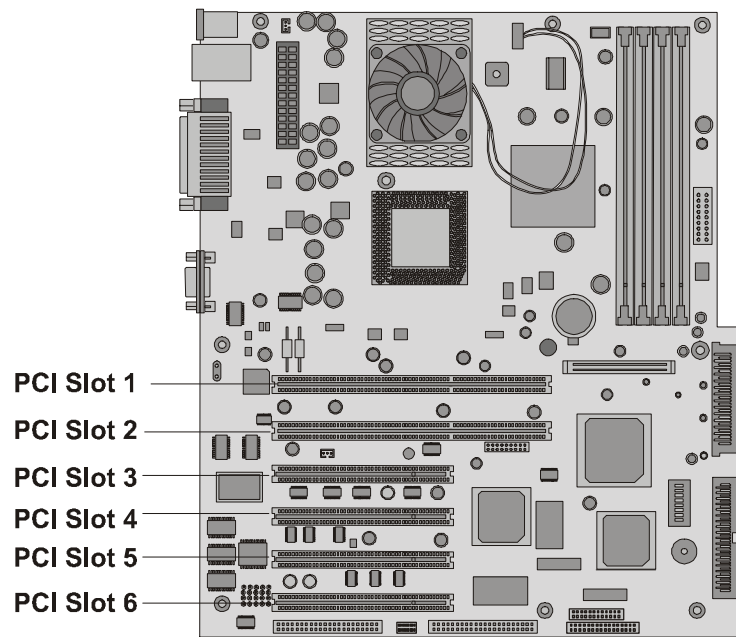
Figure 3-21. Accessory Slots

PCI Slot 1
PCI Slot 2
PCI Slot 3
PCI Slot 4
PCI Slot 5
PCI Slot 6

NOTE	Refer to the Readme file, Tested Products List, or Configuration Advisor on your *HP Server Navigator CD-ROM* for specific slot recommendations for a particular PCI board type.

8. Push the PCI slot cover from the rear of the chassis and slide it towards you to remove it. See Figure 3-22.

NOTE	Ensure you save the slot covers for use later to prevent EMI interference.
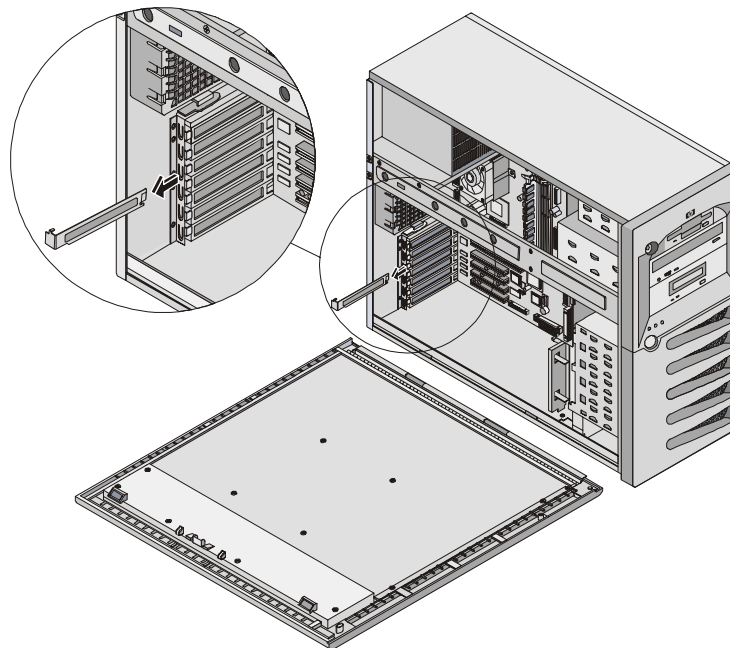
Figure 3-22. Removing Slot Cover

9. If you are installing a long accessory board, open the PCI card guide retainer.

10. Align the new board carefully, slide it into position, and press it firmly into the connector.

11. Replace the IO retaining bracket and rotate it to close.

12. Close the PCI card guide retainer if open.

13. Close the side panel.

14. Replace the external cables and power cord.

15. Power up the server and return it to normal operation.

Once the HP server is returned to normal operation, you may need to install software drivers. The drivers for the new PCI board are either part of your existing server software or included on a flexible disk or CD-ROM provided with the accessory board.

Removing an Accessory Board

Follow the steps in the preceding section, but instead of installing a card, remove the PCI card and replace the slot cover.

Racking the Server

Refer to the *Server Rack Installation Guide* for the information.

Connecting Peripheral Devices

This section provides the instructions for connecting the peripheral devices to the HP Server tc3100.

Monitor, Keyboard, and Mouse

1. Connect the monitor, keyboard, and mouse to the HP Server tc3100 using the connections provided on the rear of the chassis. See Figure 3-23.

   The two USB connectors are reserved for peripherals other than the keyboard or mouse.

   If you have a console switch box, refer to the switch box user guide for instructions on connecting the keyboard, mouse, and monitor.

Figure 3-23. Rear Panel Ports

CAUTION	The Keyboard and Mouse ports are both PS/2 ports, but are not interchangeable. If you plug the keyboard into the Mouse port or the mouse into the Keyboard port, you will get an error message and the system will not finish the boot process.

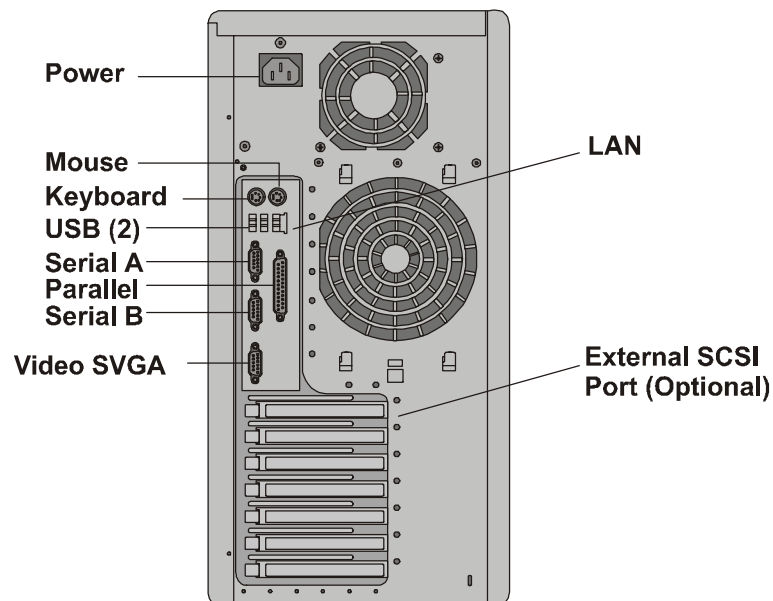2. If a LAN cable is provided, you may connect it now or wait until you have verified the HP Server's operation.

Uninterruptible Power Supply (UPS)

1. If you have a UPS installed, turn it on.

2. Connect the serial cable between the UPS and the HP Server.

   Refer to the user guide included with the UPS for additional information.

   The HP Server tc3100 performs a diagnostic test when the power switch is turned on. If an error condition occurs, refer to Chapter 6, "Troubleshooting."

Configuring the HP Server tc3100

The following sections describe how to configure the HP Server tc3100 with the help of the *HP Server Navigator CD-ROM*, which is shipped with your HP Server. This CD-ROM provides the latest information concerning your HP Server.

As you configure the server, it's important to have the very latest configuration information. The CD-ROM will inform you of any applicable compatibility issues, and provide you with a current list of HP-tested peripherals and accessories. Refer to the "Tested Products List" on the *HP Server Navigator CD-ROM* or on the HP web site at:

http://www.hp.com

You should also be familiar with HP DiagTools (on the *HP Server Navigator CD-ROM*) and the *HP Server Online Documentation CD-ROM* to help you configure the HP Server.

HP Server Navigator CD-ROM

The *HP Server Navigator CD-ROM* provides you with two modes for running the CD-ROM and accessing its configuration information utilities and resource information.

- **Setup mode:** insert the Navigator CD-ROM in your HP Server and boot from it. Use the Navigator interface to configure your system, view important information, and obtain drivers and utilities to setup your HP Server through the installation of the Network Operating System (NOS).

- **Resource mode:** insert the Navigator CD-ROM in a Microsoft Windows PC. The CD will autorun to display the Navigator interface. Use the Navigator interface to view online information resources and obtain drivers and software utilities.

Contents of the HP Server Navigator CD-ROM

The Main Menu of the Navigator CD directs you to modules where you can perform the required configuration tasks, or access the utilities used in the configuration process. These tasks include:

- Configuring the server hardware (Setup mode only)

- Preparing the server for NOS installation (Setup mode only)

- Viewing information about the server (such as Readme file, Configuration Advisories, Tested Products List)

- Obtaining software and drivers for the server

Before the HP Navigator Main Menu is displayed initially, you may be prompted to set the language, time, and date and select a Network Operating System (NOS) to be used throughout the session.

If you have questions about how to use the Navigator CD, refer to the instructions provided with the Navigator CD or the Help menu.

Obtaining HP Server Navigator Release History

The release history (archive) of the *HP Server Navigator CD-ROM* provides you with a list in numerical order of the firmware upgrades and software drivers for the HP Server. The release history is updated in the archive for each new release of the *HP Server Navigator CD-ROM*. The most current Status Report provides the latest information for your particular HP Server. To ensure you have the latest versions of the HP Server Navigator software, obtain the current HP Server Navigator CD release history in the archive.

The following items are contained in the "What's On The CD" for each CD-ROM release:

- Version number (HP Server model specific)
- HP models supported
- Release date
- Document Number
- Part number of the *HP Navigator CD-ROM*
- Major changes to the *HP Navigator CD-ROM* made for a specific release

  The "What's On The CD" for your specific *HP Server Navigator CD-ROM* describes in detail any software updates between this version of the CD-ROM and the previous version.

Accessing the HP Server Navigator CD-ROM

Use this method to start and access the *HP Server Navigator CD-ROM*.

1. Ensure the HP Server is properly connected to the mouse, keyboard, monitor, and AC power, before attempting to power up the Server.
2. Press the power-on button to turn on power to the Server.
3. Press the CD-ROM drive eject button.
4. Place the *HP Server Navigator CD-ROM* in the drive, and press the eject button again to close the drive.

   The Navigator CD should start automatically.
5. If the Navigator CD does not start automatically, turn the power off, wait 10 seconds, and turn the power on again.

   If the Server fails to boot, follow the diagnostic instructions on the screen.
6. Go to the HP Navigator Main Menu.

   For detailed information about using the Navigator CD-ROM refer to the online Help on the CD.

Viewing the Readme File

This file includes the most recent HP Server information that was not available at the time of publication for this Operations and Maintenance Guide. It is important to check this file before proceeding with the installation.

1. Start the *HP Server Navigator CD-ROM*, as explained earlier.
2. Go to the HP Navigator Main Menu.
3. Select Readme File.

   The Readme file contains the latest information to help you install your HP Server. Read it carefully before beginning your installation.

BIOS Setup Utility

The HP Server (BIOS) Setup Utility is used to configure the following server options:

- User Preferences
- Security
- Configuration
- Exit

Accessing the Setup Utility

The (BIOS) Setup Utility menu offers the choices listed above, and the corresponding items are described in the topics below.

1. Turn on the monitor and the HP Server.

2. Start the Setup Utility by pressing the F2 key, when the following message appears on the boot screen.

   ```
   Press <F2> to enter SETUP
   ```

Menu Bar

The Setup Utility provides a menu bar with several menu selections. The menu bar choices are:

- **User Preferences** - Use this menu option to set the server time, date, and keyboard functions.

- **Security** - Use this menu option to set Power-on password protections and hardware security options. Two choices are available under Security:

  o Power-On Password - Use this option to set the administrator and user passwords, which will require a password to enter the Setup Utility or complete the boot process.

    The Administrator password must be set before setting the User password or Network Server mode. Once the Administrator password is set, the Administrator can access and change all fields in the Setup Utility screens.

    If the User password is set, the user may change the system time, date, user password, and a limited number of items in the various screens of the Setup Utility. The user may view all screens in the Setup Utility, but can't alter all of the settings.

    Network Server Mode – When set, the system prompt for a password when booting from a flexible disk or CD-ROM, but not when booting from a hard drive. The power switch and keyboard are locked until the password is typed.

  o Hardware Security - Use the options to enable or disable writing to flexible disks connected to the embedded controller. Also found here are switches for allowing booting from the flexible drive, disk drive, and CD-ROM.

- **Configuration** - Use this menu option to configure I/O ports, I/O addressing, interrupts, PCI slot masters, IRQ interrupt locking, and boot device ordering. These menu selections also provide access to enable/disable the following items: the embedded USB, the Wake-on-LAN feature, and the processor serial.

  o Integrated I/O Port - Configure ports for serial and parallel, assign base addresses and interrupts, pointing devices (mouse), and console redirection for remote control.

  o Flexible Disk Drive **-** Enable or disable the flexible disk drive controller.

  o Memory Cache **-** Enable or disable memory hole and enable or disable RAM to free address space.

  o IDE Devices **-** Set primary master/slave, secondary master/slave relationships on IDE devices, and set the local bus IDE adapter.

  o PCI Slot Devices **-** Set a PCI slot as master and PCI IRQ locking. The BIOS warns of conflicts.

o Boot Device Ordering **-** Set the boot order, including bootable boards.

o Embedded LAN/USB Settings

> Embedded LAN – Enable/Disable the embedded LAN.

> Boot ROM – If enabled, the PXE boot ROM is loaded to allow the system to retrieve a boot image from another system on the network instead of booting from a local device. A boot image server must be running on the network.

> Wake-on-LAN – Wakes the server from its "sleep" state upon receiving a "Magic Packet." While the server is in the sleep state, the embedded LAN adapter scans all incoming frames addressed to the server for a specific data sequence, indicating to the NIC's controller that this is a wake-up frame. If the NIC detects the data sequence, it alerts the server's ACPI power management circuitry to wake up the server. The wake-up frame is based on the industry-standard Magic Packet specification.

> Embedded USB A&B – Enable or disable the embedded LAN and its features.

o Processor Serial Number – This feature can be enabled or disabled in the Setup Utility.

- **Exit** – Exit the Setup Utility by saving changes or exit without saving changes, which reverts to previous settings. When you exit, the HP Server reboots.

Using the Setup Screens

Online help explains the settings displayed on the Setup Utility screens. Instructions are also provided for navigating between the screens and entering or changing the setup data.

- Press the right-arrow and left-arrow keys to move between selections on the menu bar. The menu bar is present at the top of the main selections.

- Press the up-arrow and down-arrow keys to move between fields on each screen. The currently-selected field will be highlighted.

- Certain fields ask you to choose from a list of entries. In such cases, press the plus (+) or minus (-) keys repeatedly to display each possible entry, or the Enter key to choose from a pop-up menu.

- Small arrow points (➤) precede some field names. This means the field is actually a submenu. To visit the submenu, select it with the arrow keys and press the Enter key. The submenu then appears in place of the current screen.

- The Esc key is the exit key. If you press the Esc key on one of the top-level screens, the Exit menu appears. If you press Esc on a submenu, the previous screen appears. When you are making selections from a pop-up menu, use the Esc key to close the pop-up without making a selection.

Changing the System Date and Time

Use this topic to change the HP Server's date and time and refer to the following procedure.

1. To reach the Setup Utility, boot or reboot the system and press F2 when prompted.

2. If necessary, use the left-arrow key to select User Preferences from the menu bar at the top of the screen.

   Once in the Setup Utility, the menu bar appears at the top of the screen with "User Preferences, Security, Configuration, and Exit" shown. The User Preferences menu is the default menu and should be the highlighted selection at the left of the menu bar when the Setup Utility first opens.

3. If necessary, use the up-arrow key to move to the System Time field.

   The "System Time" field is highlighted by default when the "User Preferences" menu is selected. This field actually consists of three sub-fields enclosed in brackets [xx:xx:xx]: hours to the left (24-hour clock), minutes in the middle, and seconds to the right.

4. Type in the hour and press Enter to move to the minutes field.

5. Then type in the minutes and press Enter again to move to the seconds field.

6. Type in the seconds and press Enter, then use the arrow keys to leave this field.

7. Scroll to System Date field to enter the system date in the field.

    The dates are entered in the "System Date" field in the same way as the time is entered in the "System Time" field. This field also has three separate sub-fields for month, day, and year enclosed in brackets [xx/xx/xxxx].

8. Type in the month and press Enter to move to the day field.

9. Then type in the day and press Enter again to move to the year field.

10. Type in the year and press Enter, and then use the arrow keys to leave this field.

    Ensure you enter all four digits for the year.

11. Use the right-arrow or left-arrow key to select the Exit menu.

12. Choose Exit Saving Changes from the list of exit options, then press Enter.

    A dialog appears and asks you to confirm your decision.

13. Choose Yes and then press Enter.

    The HP Server reboots and the date and time changes have been accepted.

Setting the HP Server's Boot Passwords

Use this topic to set a password to boot the HP Server. Further, you can have a separate administrator password and user password, but the user password is limited in access once booted.

To configure the HP Server for a password, which will require a password on boot-up, refer to the following procedure.

1. If not already in the Setup Utility, boot or reboot the system and press F2 when prompted.

2. Use the right-arrow or left-arrow key to select Security from the menu bar.

    As soon as it is selected, the selections for the Security menu appear as shown below.

    ➢**Power-On Password**

    ➢**Hardware Security**

    The arrowhead ➢ indicates there is a submenu to select from.

3. If necessary, use the arrow key to move to the Power-On Password menu selection and press Enter.

    The Power-On Password is highlighted by default when the Security menu is selected.

    The first line in the menu is, "Administrator Password is [Set or Not Set]."

    o If no password has been set, then "Not Set" will appear in the field. If this is the case, then you are not allowed to set the User password until you set an Administrator password. With no password set you can still boot the server without a password.

       The Administrator password controls access to the Setup Utility and its settings, but will not be in effect until you "Set" the password and reboot the server.

    o If "Set" is in the field, then you can change the Administrator password or scroll to the User password and change it. If you do not know the existing Administrator password, then refer to "Password Problems" in Chapter 6, "Troubleshooting."

NOTE   You must set the Administrator password before setting the User password. The Administrator password is the only password required to configure the HP Server to boot with a password.

---

4. Press the Enter key to enter a new password or change the old one.

   A pop-up menu appears titled, "Set Power-On Password." If no password has been entered, the field "Enter new password: [   ]" is highlighted. If a previous password has been entered, the field "Enter old password: [   ]" is highlighted.

NOTE   To leave the pop-up menu without entering a password, press the Esc key at any time.

---

5. Enter the password (new or old) in the appropriate field and press Enter.

   The password is accepted and the next field just below it, "Re-enter new password: [   ]" or "Enter new password: [   ]" field is highlighted. For security reasons, the password does not appear on the screen.

6. If necessary, enter the new password in the "Enter new password: [   ]" field and press Enter.

NOTE   Entering nothing or "blank" in the "Enter new password" field followed by entering nothing or "blank" in the "Re-enter new password" field will turn off the password setting, changing it to "Not Set." If the Administrator Password is changed to "Not Set," the User password is forced to "Not Set."

---

7. Enter the new password again in the "Re-enter new password: [   ]" field and press Enter.

   After re-entering the new password and pressing enter, the pop-up menu disappears and the "Administrator Password is" field changes to "Set" and on the next boot the HP Server will request a password to access the Setup Utility and complete the boot process.

8. If you only want a single password (Administrator), you may skip the "User Password is:" field and go to Step 10 to exit the utility and save changes.

9. If you want to enter a User password, use the arrow key to scroll to the "User Password is:" field and repeat Steps 4-7 for the User password.

10. If you have finished setting or changing passwords, press the Esc key to exit this menu.

11. Use the right-arrow key to go to the Exit menu.

12. Choose Exit Saving Changes from the list of exit options, and then press Enter.

   A dialog appears and asks you to confirm your decision.

13. Choose Yes and then press the Enter key.

   The HP Server reboots and the password changes have been accepted. After the server reboots, you will be required to use your new password to enter the Setup Utility or complete the boot process. If you forget your password, refer to "Password Problems" in Chapter 6, "Troubleshooting."

14. To change one of the passwords at a later date, return to the Security menu and repeat Steps 2 through 7 above for one or both passwords.

Remote Console Feature

The HP Remote Console is built into the HP Server's BIOS and is NOS independent. This feature uses HP's BIOS-level remote access to diagnose and remedy problems associated with a server's hardware operations or configuration.

Enabling the Remote Console Feature

To enable the Remote Console feature of the HP Server tc3100, enter the BIOS Setup Utility as described previously, then do the following:

1. Select Configuration from the menu bar.

2. Select Integrated I/O Ports.

3. Select Serial Ports.

4. Select Console Redirection.

5. Set the Com Port Address to 3F8/IRQ 4 (Serial Port A).

6. Select a baud rate.

7. Select console type.

8. Select flow control.

9. Select modem for console connection.

10. Then, after setting up your server and a remote PC console with modems, you install your terminal emulation software (pcANYWHERE32 included with the server) on the remote console to establish a connection. For in-depth details on configuring and using the Remote Console feature, refer to the "Remote Administrator Guide" on the *HP Server Online Documentation CD-ROM*.

About the Remote Console Feature

The following text and illustration show how HP's Remote Console is connected to the HP Server.
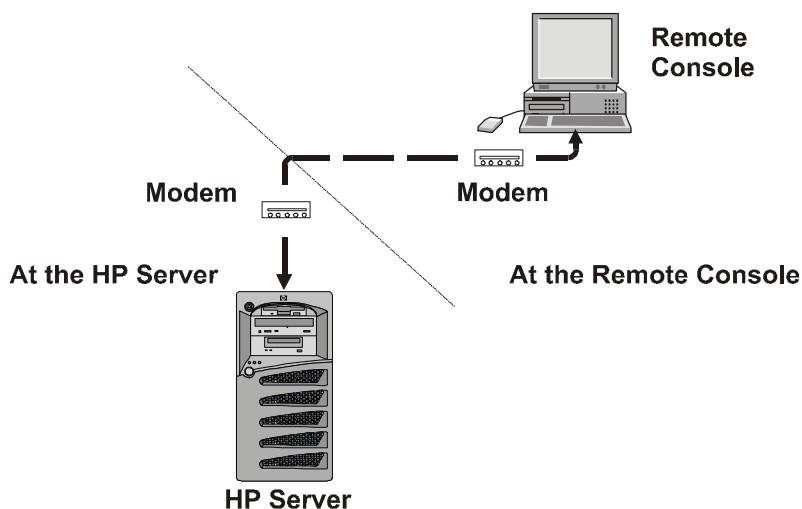

Figure 3-24. HP Remote Console Setup

1. At the server – After using the Utility Partition Console Redirection feature to set the server to receive, the server may be taken over by the remote console.

2. At the Remote Console – Using a modem and pcANYWHERE32, the offsite remote console workstation may dial into and run diagnostic utilities on the HP Server.

Using the Remote Console feature, you can remotely access a customer's Server Utility Partition to:

- Update the server BIOS.

  This feature is particularly useful since it allows you to update a server's BIOS remotely.

- Run HP server DiagTools.

  This utility provides you with ways to test a server's hardware components, including system board function.

- Remotely boot the server and view startup messages.

- Set or reset server keyboard language.

In addition, your HP Server tc3100 includes pcANYWHERE32 communications software (by Symantec Inc.) to graphically redirect your Windows NT server console to a remote location. For in-depth details, refer to the "Remote Console Feature" on the *Online Documentation CD*.

SCSI Configuration Utility

The HP Server uses the Symbios SCSI Configuration Utility to verify or modify the embedded SCSI controller settings for the devices connected to the two SCSI channel connectors on the system board. If you need to verify or modify SCSI controller settings, or if you need to low-level format SCSI disks or verify SCSI disk media, run the Symbios Configuration utility.

NOTE	You typically would not need to use this utility unless you are an experienced administrator or requested to do so by a support provider.

During the boot process the message "Symbios, Inc. PCI Boot ROM successfully loaded" will appear if there are devices connected to the SCSI controller. The SCSI controller can provide the bus, device, and channel configurations when active on screen.

To access the Symbios SCSI Configuration Utility, refer to the following instructions:

1. Reboot the HP Server.

    If you are already in the boot process, you should see the following message appear.

    ```
    Press Ctrl C to start Symbios Configuration Utility...
    ```

2. Press Ctrl+C keys to enter the utility.

3. Use the arrow keys to move the cursor, press Enter to select an option, and press Esc to exit.

4. To change SCSI controller settings:

    a. Select an embedded SCSI controller or SCSI adapter from the list in the main menu and press Enter.

    b. Select Adapter Setup.

        This option configures the SCSI controller ID setting and other advanced controller settings.

5. To format a hard disk or change hard disk parameters:

    a. Select an embedded SCSI controller or SCSI adapter from the list in the main menu and press Enter.

    b. Select Device Selections and press Enter.

    c. Select the hard disk to format and press Enter.

    d. Select Format menu option and press Enter.

CAUTION	Low-level formatting of a SCSI disk drive will destroy all of its data.

4 Diagnostics

When the server boots, a series of tests are displayed on the screen. The number of tests displayed depends on the configuration of the server. The following are the kinds of errors a user might get with the HP Server:

- Built-in diagnostic Error Messages.
- BIOS and other error messages. These are errors detected by the system BIOS outside the built-in diagnostics or application errors.

To see the Power On Self-Tests (POST):

- The HP Server must be functionally able to run the diagnostics.
- The video subsystem must be functional.
- The keyboard must be functional.

| NOTE | BIOS ROM version number is displayed on the monitor screen during power-up. |

Power-On Self Test (POST)

The diagnostics (Power-On Self-Test "POST") run automatically each time the server is powered on. These diagnostics, which reside in the BIOS ROM, isolate server-related logic failures and indicate the board or component that needs to be replaced, as indicated by the Error Messages. Most server hardware failures will be accurately isolated by the diagnostic.

| WARNING | You should always turn off the power and disconnect the power cord to the server before opening the HP Server and touching the internal components. Failing to do so can expose you to electric shock and the server's components to damage. The power switch does NOT turn off standby power, so disconnect the power cord to turn off standby power. |

There are two kinds of error messages that appear during the POST process and the causes of these messages may prevent the server from completing the boot process. These are:

- Messages in reverse video (black text on white background).

  Refer to the *HP Server Navigator CD-ROM* to see a definition of the message and what action to take to remedy the problem.

- Power-On Self Test (POST) errors - These display in normal video (white text on black background) and may be a text message or an alpha-numeric code. If an error with a text message occurs during the POST, details of the error are displayed. Follow the instructions on the screen. If an alpha-numeric code appears, refer to the *HP Server Online Documentation CD-ROM*.

No Error Messages Displayed

General Checks:

1. All external cables and power cables are firmly plugged in.
2. The power outlet is working.
3. The server and monitor are turned on. (The power-on indicator should be illuminated.)
4. The display's contrast and brightness settings are correct.
5. All internal cables are properly connected and all boards firmly seated.
6. Verify the processor and its heatsink-fan are fully seated in its socket on the system board.
7. Verify the Memory is installed correctly and fully seated.
8. Verify the slots and tabs are aligned in the DIMM connector.

After Installing an Accessory:

1. Turn off the monitor, the server, and any external devices.
2. Unplug all cables from the power outlet.
3. Open the side panel.
4. Check the following:

    a. If you have installed an accessory board, verify the board is firmly seated in its slot and any switches or jumpers on the accessory board are properly set.

       Refer to the documentation provided with the accessory board.

    b. Check all internal cabling and connections.

    c. If you have changed any switches on the system board, verify each one is properly set.

NOTE	Only two of the eight switches on the configuration switch are used.

5. Close the side panel and connect all cables.
6. Turn on the monitor and server.
7. If the server still does not work:

    a. Repeat steps 1, 2, and 3 of this section.

    b. Remove all accessories, except the primary boot hard disk drive.

    c. Close the side panel and connect all cables.

    d. Turn on the monitor and the server.

    e. If the server now works, replace the boards and accessories one at a time to determine which one is causing the problem.

POST Error Messages

If you get a POST text error message in reverse video, refer to the *HP Server Navigator CD-ROM* to get a more detailed explanation and a possible solution.

If the server starts, but POST still reports an error message, clear the CMOS configuration, as described later in this chapter.

NOTE	HP recommends you correct the error before proceeding, even if the server appears to start successfully.

Table 4-1 describes typical POST text errors and the corrective action you may take to remedy the problem.

Table 4-1. POST Error Messages

Message	Corrective Action
Operating system not found	- Verify the desired boot drive has power and its SCSI cable is connected. - Verify the SCSI cable is securely plugged into the SCSI connector on the system board. - Verify the boot device is enabled in the Setup Utility under the Security menu. - Verify the boot device has an operating system installed. If the problem persists, contact your HP support organization.
Keyboard error	Verify the keyboard is connected to the correct connector (not the mouse connector) at the rear of the server. If the problem persists, replace the keyboard or contact your HP support organization.
Mouse error	Verify the mouse is connected to the correct connector (not the keyboard connector) at the rear of the server. If the problem persists, replace the mouse or contact your HP support organization.
If no message appears (screen is blank)	- If no text or messages appear, listen for the beep codes. Refer to the Service manual on the *HP Server Online Documentation CD-ROM*. - If no message appears but the server stops after POST, verify the DIMMs are correctly installed.
If a configuration error occurs	If a server configuration error is reported during the startup routine, clear the CMOS memory as described in Chapter 6, "Trouble Shooting" and restart the server.
System CMOS checksum bad	- Press F2 to run Setup. - Change settings as required. - Choose the Exit option, selecting Save Changes and Exit to save the new settings. The server should reboot.

Clearing the CMOS Configuration

You may need to clear the CMOS configuration if the configuration has been corrupted, or if incorrect settings made in the Setup Utility have caused error messages to be unreadable.

To clear the configuration:

1. Turn off power to the server and open the side panel.

2. Move switch 4 in the configuration switch on the system board (labeled "Clear CMOS") to the ON position. See Figure 4-1.

3. Turn on power to the server.

   A message displays indicating the configuration has been cleared.

4. Turn off power to the server.

5. Return switch 4 on the system board to the OFF position.

6. Close the side panel.

7. Turn on power to the server.

8. Press F2 to run the Setup Utility when `<F2=Setup>` appears.

9. Make any configuration changes required.

10. Choose the Exit option and save the changes to save the configuration and exit the Setup Utility.
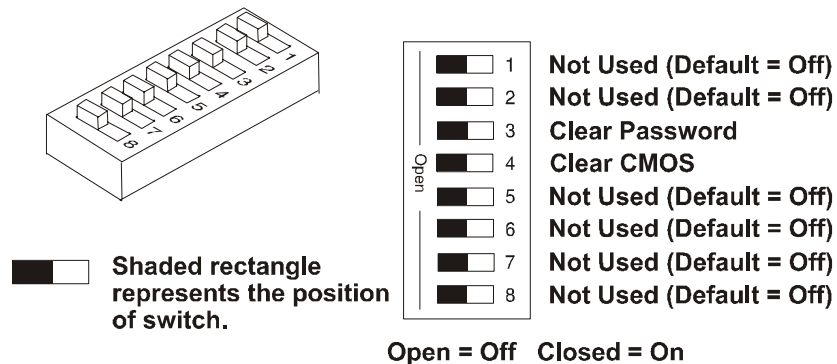

Figure 4-1. Configuration Switch Positions

HP Management Solutions

HP Management Solutions is a comprehensive suite of utilities, applications, and built-in features to manage servers locally or from remote locations. If you are unfamiliar with these products or concepts,

- Go to the Management Web site on the HP Web Site at:

  http://www.hp.com/toptools

  to view information on HP TopTools and all management options for your HP Server.

The following management options, briefly described here, are available for the HP Server tc3100. Read the *HP Server Management Reference Guide* included with your server for more information. This guide covers TopTools and all server management utilities and options for the server.

- HP TopTools Software – This is the HP browser-based management software that provides remote administration and monitoring of critical server components.

- Integrated Remote Assistant – This is an embedded product called HP Integrated Remote Assistant (also referred to as Integrated RA). Integrated RA combines intelligent hardware and software to provide administrators with instant notification of HP Server operations and events.

- LAN A Power On/Off and Wake-on-LAN (WOL) – These options allow simple remote server power management through the Embedded LAN A port. This feature allows the administrator to remotely power off, on, reset or power cycle the server. To use the WOL option, it must be enabled in the server's (BIOS) Setup Utility under Embedded LAN/USB Settings (Configuration > Embedded LAN/USB Settings).

HP Server DiagTools

The purpose of hardware diagnostic software is to provide tools for checking hardware problems. By design, diagnostic software executes simple tests of each hardware component. Usually, such tests assure that hardware is not the source of server problems. This allows the user to eliminate hardware as the cause of the problem and to focus on operating system configuration parameters, network connections, and application software configuration parameters as the source of the problem.

If hardware problems are confirmed, the diagnostic software program can sometimes detect and diagnose the subsystem or specific server component causing the problem. In addition, diagnostic tools can capture information that allows support personnel to quickly assess the condition of the server.

In order to be effective, diagnostic software tools must be used in the context of a wider troubleshooting procedure.

DiagTools for HP Servers is a set of offline diagnostic tests, including tests for system and processor components, memory and storage elements, ports, and input/output devices. DiagTools is supplied on the *HP StartUp CD-ROM*.

The user prepares DiagTools software for use by transferring it to a diskette. Then the DiagTools diskette is used to boot the server. A basic suite of tools checks key server components, and a menu of advanced tests is available for in-depth testing.

DiagTools has the ability to test the following components:

- system board
- memory modules
- flexible disk drives
- parallel ports
- video monitor

- processors
- hard disk drives
- keyboards
- CD-ROM drives

DiagTools is an offline diagnostic. Offline diagnostics do not use the main operating system (OS) of the HP Server. The alternate DiagTools OS has far fewer features than the full-fledged OS. Thus, its capabilities are limited to a set of basic tests and a series of advanced tests. In addition, DiagTools does not use any tests which might write over and thus destroy user data. Tests that require user inputs or decisions are left to the advanced series of tests.

You can use DiagTools to perform the tasks listed below:

- display a high-level inventory of the server under test
- save and print a detailed inventory of hardware components
- conduct a basic test of components listed in the server inventory
- display "PASSED" or "FAILED" overall results of basic tests
- record detailed test results of basic server tests
- display a menu of advanced tests
- select and run one or a series of advanced tests
- add the record of results of advanced tests to the record of basic tests
- view a list to locate the meaning of a specific error code
- view one or more steps to help confirm and isolate error conditions
- browse the Support Ticket, which contains the detailed inventories and test results
- add comments to the Support Ticket

About Error Messages

A hexadecimal number designates each error message reported by DiagTools; a short note on the type of error; and a list of one or more steps the user can take in response. When you run a test, it exercises many aspects of the hardware, so the number of possible error messages exceeds 300. Most of these are encountered rarely, if ever.

Error codes can be viewed on line from the DiagTools User menu within the advanced series of tests, or you can refer to the *HP Server DiagTools Error Reference and User Guide*.

Advantages and Limitations of Hardware Diagnostics

Offline diagnostic software is useful in making sure that hardware has been eliminated as the cause for possible server problems. Such diagnostic tools can easily be shipped with a server, and they are relatively easy to use.

Only experienced personnel knowledgeable of its limitations should use offline diagnostic software.

Some limitations are:

- booting the server from the diagnostics diskette

- no access to operating system error logs, since the OS is not operating at the same time as the diagnostic tools

- limited ability to test only a single component at a time

- inability to indicate problems with wrongly configured servers or the network

HP TopTools

HP TopTools is the browser-based management software that provides remote administration and monitoring of critical server components. TopTools (with the server component) provides vital information for the fastest troubleshooting and proactive management of your HP Servers. Processors, memory, storage, and NICs are a few examples of the components managed by TopTools.

TopTools is included with every HP Server and should be installed to help your service provider troubleshoot your HP Server. TopTools is located on the *HP TopTools CD-ROM*.

For sites with a single-server installation, you may not need the power of the web-based HP TopTools. Instead, *HP TopTools Auto Alert* and *Local TopTools for Servers*, included on the *HP Server Navigator CD-ROM* can provide all the tools you need to manage your small business environment. Local TopTools for Servers provides the same information as HP TopTools but is run directly at the server. Local TopTools for Servers is automatically installed on your server when using the *HP Server Navigator CD* to install your Network Operating System. HP TopTools Auto Alert may be installed either from the *HP TopTools CD-ROM* or the *HP Server Navigator CD-ROM*.

- See the *HP Server Management Reference Guide* for detailed installation instructions.

- You can also download the TopTools software and documentation from the TopTools Web Site at:

  http://www.hp.com/toptools

Some of the features of TopTools include:

- Notification of problems with key hardware components, including memory, disk drives, SCSI controllers, and NICs

- Unified event log to review a complete history of server activity in one place

- Predictive disk problem warning backed by HP's pre-failure warranty replacement

- Disk capacity threshold alert and usage tracking

- View of critical server inventory information, such as the BIOS version, driver and firmware versions, PCI slot contents, and serial and parallel ports

- Easy linkage with leading management platforms, including HP OpenView Network Node Manager and Computer Associates' Unicenter TNG and Tivoli products

- HP TopTools AutoAlert provides proactive warning of problems and advice on quick resolution through a friendly "traffic light" user interface

- Support for DMI 2.0, which provides the same Desktop Management Interface inventory information for servers as for desktop PCs

5 Error Messages

Power-On Self Test (POST) Error Codes

Error messages (POST Codes) are encountered if an error condition occurs during the boot process of the HP Server tc3100. All codes and their respective descriptions are listed in the following table; all the codes may not apply to your server.

These codes will appear on the display monitor, provided it and the supporting circuitry are functioning.

| NOTE | Do not take remove/replacement actions until you have taken other troubleshooting steps. See "Troubleshooting Checklist" in Chapter 6, "Troubleshooting." |

Table 5-1. POST Error Codes

Code	Description	Problem/Solution
0000	System Board error	POST has detected a failure limited to the system board internal unstable behavior, or a system hang during the boot process. Skipping this error message and continuing may result in unstable behavior, or a system hang during the boot process. To verify this error: 1. Reboot the server. 2. If this error continues, the system board may need to be replaced. Contact your service representative.
0010	BIOS problem	The PC configuration has been lost, cleared, corrupted, or has not been initialized. When the HP Server remains unplugged for a long period of time, the battery will discharge and not provide enough current to keep the CMOS memory powered. To correct this: 1. Verify the battery is properly inserted. 2. If necessary, replace the battery as described in your user's guide. 3. Run the Setup Utility to re-configure your server.
0011	Battery problem	The server BIOS is not responding due to a possible battery discharge. If the HP Server was unplugged for a long period of time, the battery will discharge and not provide enough current to keep the system date and time current. To correct this: 1. Verify the battery is properly inserted. 2. If necessary, replace the battery. 3. Set time and date using the Setup Utility or from your operating system.
0012	BIOS initialization problem	The HP Server configuration has been cleared or has not been initialized. Run the Setup Utility to re-configure your system.

Code	Description	Problem/Solution
0020	ISA initialization problem (This does not apply to tc3100)	The ROM on the accessory board is bad or the board has a conflict with a system board reserved resource (address, DMA, or IRQ). To correct this: 1. Change the resources used by the ISA accessory boards. 2. Try to disable (free) resources used by system board devices. 3. If the problem persists, the accessory board may be defective. Contact the accessory board vendor.
0021	PCI Configuration conflict	A configuration problem has occurred with a PCI device. The PCI device or accessory board doesn't match PC setup settings or has conflicts with PC resources (reserved memory space, IRQ or DMA channels). To correct this: 1. Clear the PCI configuration with the CMOS status switch. Refer to Chapter 6, "Troubleshooting." 2. If necessary, use the Setup Utility to manually configure the PCI devices. 3. Check for any further PC resource, which can be used. Use Setup Utility to disable any unused function, such as I/O ports or IDE controllers. 4. Start the Operating System and let it update the PCI configuration.
0022	Plug & Play ISA initialization problem (This does not apply to tc3100)	The Plug & Plug ISA accessory board has reported an initialization problem. The ROM on the accessory board is bad or the Plug & Play BIOS cannot solve a conflict issue with a system board reserved resource. To correct this: 1. Clear the Plug & Play configuration with the CMOS status switch. Refer to Chapter 6, "Troubleshooting." 2. Try to disable (free) resources used by system board devices. 3. Run the Plug & Play utility supported by your Operating System. 4. If the problem persists, the accessory board may be defective. Contact the accessory board vendor.
0030	Processor Speed selection problem (This does not apply to tc3100)	POST has detected the processor speed selected with system board switches does not match the processor's speed. Refer to Chapter 6, "Troubleshooting," for the correct switch setting.
0040	PC Serial Number initialization problem	POST has detected the PC Serial Number has been lost or has not been initialized. Pressing F2 will automatically run the HP Serial (BIOS) Utility and allow you to enter the Serial Number.
0050	Processor Cooling/Heating problem	POST has detected a cooling fan problem. The processor cooling fan needs to be connected.

Code	Description	Problem/Solution
0076	Integrated HP NetRAID processor is not responding. (This does not apply to tc3100)	This problem will prevent the operation of the Integrated HP NetRAID, if it is enabled. The problem may also prevent operation of some PCI slots. 1. Flash the Integrated HP NetRAID firmware and reboot the system. 2. If the error persists, your I/O board may need to be replaced. Contact your service representative.
0100	Keyboard error during POST	A key on the keyboard has been pressed during POST of the HP Server. To correct this: 1. Ensure nothing is placed on the keyboard and no key is accidentally pressed down. 2. Reboot the server. 3. If the error persists, your keyboard may need to be replaced. Contact your service representative.
0101	Keyboard error	The keyboard has reported an error during its self-test. To correct this: 1. Restart your HP Server. 2. If the error persists, your keyboard may need to be replaced. Contact your service representative.
0102	Keyboard controller error	POST has detected a general failure in the integrated keyboard controller. To verify this error: 1. Restart your HP Server. 2. If the error persists, your system board may need to be replaced. Contact your service representative.
0103	Keyboard is not connected	POST has detected the keyboard is not connected. To correct this: 1. Verify the keyboard connector is firmly connected. 2. Reboot the server. 3. If the problem persists, your keyboard cable may be damaged or your keyboard may need to be replaced. Contact your service representative.
0105	Mouse boot error	The system board has detected a mouse error during POST. To correct this: 1. Clean the mouse and its moving ball as described in the User's Guide. 2. If the problem persists, your mouse may need to be replaced. Contact your service representative.
0106	Mouse is not responding	The system board has detected the mouse is not responding. To correct this: 1. If the mouse has just been removed, press Esc to automatically validate the change. 2. Otherwise, verify the mouse connector is firmly connected. 3. If the problem persists, your mouse may need to be replaced. Contact your service representative.

Code	Description	Problem/Solution
0108	Mouse and Keyboard connections reversed	POST has detected the mouse and keyboard connections are reversed. To correct this: 1. Turn the server off. 2. Swap the mouse and keyboard connections. 3. Turn on the server power and reboot the server.
0200	Serial Port Controller resource conflict	POST has detected an address space or IRQ resource conflict between one of the integrated serial port controllers and an accessory board. To correct this: 1. If an integrated serial port is not needed, run the Setup Utility and disable the related serial port. 2. If the integrated serial port is needed and its settings cannot be modified, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0201	Parallel Port Controller resource conflict	POST has detected an address space or IRQ resource conflict between the integrated parallel port controller and an accessory board. To correct this: 1. If the integrated parallel port is not needed, run the Setup Utility and disable the parallel port. 2. If the integrated parallel port is needed and its settings cannot be modified, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0300	Flexible disk drive (A) boot error	POST has detected the flexible disk drive (A) reported an error during its self-test. To correct this: 1. Verify a diskette can be properly inserted and removed from the flexible disk drive. 2. Verify the flexible drive type configured in the Setup Utility matches the flexible disk drive installed in the HP Server. 3. Verify all data cables and power cables are firmly connected. 4. If the problem persists, your flexible disk drive may need to be replaced. Contact your service representative.
0301	Flexible disk drive B boot error (This does not apply to tc3100)	POST has detected the flexible disk drive B reported an error during its self-test. 1. Verify a diskette can be properly inserted and removed from the flexible disk drive. 2. Verify the flexible drive type configured in the Setup Utility matches the flexible disk drive installed in the HP Server. 3. Verify all data cables and power cables are firmly connected. 4. If the problem persists, your flexible disk drive may need to be replaced. Contact your service representative.
0305	Flexible Disk Drive Cable conflict (This does not apply to tc3100)	The flexible disk drive A is connected to the connector configured for flexible disk drive B. 1. Run Setup Utility by pressing F2. In the flexible disk drive section, enable the A & B flexible disk swap. 2. Alternatively, if the connector allows it, connect the flexible disk drive to the other connector on the flexible disk drive cable.

Code	Description	Problem/Solution
0306	Flexible disk drive controller boot error	POST has detected a general failure on the integrated flexible disk controller. To verify this: 1. Restart your HP Server. 2. If the error persists, your system board may need to be replaced. Contact your service representative.
0307	Flexible disk drive controller resource conflict	POST has detected an address space or IRQ resources conflict between the integrated flexible disk controller and an accessory board. To correct this: 1. If the integrated flexible disk controller is not needed, run the Setup Utility and disable the flexible disk controller. 2. If the integrated flexible disk controller is needed, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0400	CD-ROM boot error	POST has detected the CD-ROM drive has reported an error during its self-test. To correct this: 1. If a CD-ROM disk is present, verify it is correctly inserted. 2. Verify the CD-ROM drive door or tray has not been opened or closed during the self-test. 3. Verify all data cables and power cables are firmly connected. 4. If the problem persists, your CD-ROM drive may need to be replaced. Contact your service representative.
0401	CD-ROM drive not responding	POST has detected the CD-ROM drive is not responding, but is configured in the Setup Utility. To correct this: 1. If the CD-ROM drive has just been removed, press F4 to automatically validate the change. 2. Verify all data cables and power cables are firmly connected. 3. If the cable is damaged, connect the CD-ROM to another cable, if available. The Setup Utility and the 32-bit disk access driver may need to be modified accordingly. 4. If the problem persists, your CD-ROM drive may need to be replaced. Contact your service representative.

Code	Description	Problem/Solution
0500	Hard Disk (primary) controller boot error	POST has detected a general failure on the integrated (primary) hard disk controller. To correct this: 1. Restart your HP Server. 2. If the error persists, your system board may need to be replaced. Contact your service representative. (The following does not apply to tc3100) 1. If no device uses the other IDE channel, connect your hard disk drive to the other cable to operate with the secondary controller. Verify the secondary IDE controller is enabled in Setup. 2. If the IDE device operates with the secondary channel, your system board may need to be replaced to recover primary channel functionality. Contact your service representative. 3. If the device does not operate on either channel, the IDE device may be defective. Contact your service representative.
0501	Hard Disk secondary controller boot error (This does not apply to tc3100)	POST has detected a general failure on the integrated secondary hard disk controller. 1. If no device uses the other IDE channel, connect your hard disk drive to the other cable to operate with the primary controller. Verify the primary IDE controller is enabled in Setup. 2. If the IDE device operates with the primary channel, your system board may need to be replaced to recover secondary channel functionality. Contact your service representative. 3. If the device does not operate on either channel, the IDE device may be defective. Contact your service representative.
051X	Hard Driver boot Error (This does not apply to tc3100) (Error codes #0510, #0511, #0512, and #0513 apply to IDE0, IDE 1, IDE 2, and IDE 3 respectively as described in the Setup Utility).	POST has detected the specified hard disk drive reported an error during its self-test. To correct this: 1. Check the hard disk drive configuration with the Setup Utility. 2. If necessary, edit the user hard disk parameters to set lower values. 3. If the problem persists, your drive may need to be replaced. Contact your service representative.
052X	Hard Drive not responding (This does not apply to tc3100) (Error codes #0520, #0521, #0522, and #0523 apply to HDD0, HDD1, HDD2, and HDD3 respectively as described in the Setup Utility).	POST has detected the specified hard disk drive is not responding, but is configured in the Setup Utility. To correct this: 1. If the specified hard disk has just been removed, press F4 to automatically validate the change. 2. Verify all data cables and power cables are firmly connected. 3. If the cable is damaged, connect the hard disk drive to another IDE cable, if available. 4. If the problem persists, your hard disk drive may need to be replaced. Contact your service representative.

Code	Description	Problem/Solution
053X	Hard Disk drive connection problem (This does not apply to tc3100) (Error code #0530 is the primary channel cable IDE1 and #0531 is the secondary channel cable IDE2)	POST has detected a hard disk drive on the second (slave) position on the IDE cable, but no hard disk has been found on the first (master) position. To correct this: 1. If only one hard disk is connected on the cable, disconnect the hard drive and use the other connector to re-connect the hard drive into the first (master) position. 2. If two disks are connected on the cable, verify all data cables and power cables are firmly connected for both hard disk drives. 3. If the error message appears just after a hard disk drive installation, check for master/slave specific jumper configurations in the hard disk drive installation manual. 4. If the problem persists, the hard disk drive may need to be replaced. Contact your service representative.
0540	Hard Disk Controller resource conflict	POST has detected an address space or IRQ resource conflict between the integrated hard disk controller and an accessory board. To correct this: 1. If the integrated hard disk controller is not needed, run the Setup Utility to disable it (primary or secondary). 2. If the integrated hard disk controller is needed, the accessory board's IRQ and address space must be reconfigured to use other free resources. Refer to the accessory board installation manual for information.
0600	Video Memory boot error (This does not apply to tc3100)	The video memory size detected during POST is smaller than previously detected. To correct this: 1. If you have changed your video adapter, press F4 to automatically validate the change. 2. If the problem persists, the system board may need to be replaced. Contact your service representative.
0700	DIMM size boot error	The system memory size detected during the POST is smaller than previously detected. One or several DIMMs are either disconnected, or have been replaced by smaller ones. To correct this: 1. If some main DIMMs have just been removed or replaced by smaller ones, press F4 to automatically validate the change. 2. If no DIMM has been removed or changed, ensure all DIMMs are properly inserted in the slots. 3. If the problem persists, one of the DIMMs may need to be replaced. Contact your service representative.
0712	DIMM installation error	POST has detected an incorrectly installed DIMM or the failure of one or more DIMMs. To correct this: 1. If additional memory was just installed in your server, please verify the installation conforms to the description in the User's Guide. 2. If this error was reported when no additional memory was just installed, restart the server. 3. If the error persists, contact your service representative.

Code	Description	Problem/Solution
0713	Incorrect DIMM installed	POST has detected one or more DIMMs are not the correct type, or the correct speed. To correct this: 1. If additional memory was just installed in your server, please verify the correct DIMM type and speed for this server was installed. Refer to the DIMM description in "Memory Modules" in Chapter 3, "Installing and Configuring." 2. If this error was reported when no additional memory was just installed, restart the server. 3. If the error persists, contact your service representative.
0800	Cache memory size error	POST has detected the cache memory size is smaller than previously detected. To correct this: 1. If the processor module has just been replaced, press F4 to automatically validate the change. 2. If the problem persists, the processor module may need to be replaced.
0801	Cache boot error	POST has detected an error in the cache memory module. To correct this: 1. Verify the processor module is installed correctly. Refer to "Memory Modules" in Chapter 3, "Installing and Configuring" for handling precautions. 2. If the problem persists, the processor module may need to be replaced.
0900	Integrated LAN disable error	The system could not disable the integrated LAN. To correct this: 1. Reset the Integrated LAN by powering off the HP Server. 2. Disconnect the power cord for 20 seconds. 3. Reconnect the power cord and power on the HP Server. 4. If the error appears upon restarting, update the system BIOS. 5. Insert the HP Navigator CD-ROM in the CD-ROM drive and power-cycle your system. This will initialize the flash utility on HP Navigator CD-ROM. 6. If the error persists, the system board may need to be replaced. Contact your service representative.

Code	Description	Problem/Solution
0901	Integrated LAN enable error	The system could not enable the integrated LAN. To correct this: 1. Reset the Integrated LAN by powering off the HP Server. 2. Disconnect the power cord for 20 seconds. 3. Reconnect the power cord and power on the HP Server. 4. If the error appears upon restarting, update the system BIOS. 5. Insert the *HP Navigator CD-ROM* in the CD-ROM drive and power-cycle your system. This will initialize the flash utility on the *HP Navigator CD-ROM*. 6. If the error persists, the system board may need to be replaced. Contact your service representative.
0A00	Display refresh rate error	The parameters returned by the display do not match the DDC standard used by the server for automatic setup of ergonomic refresh rates. To correct this: 1. Disable the 'Plug & Play Display' feature in the Setup Utility to avoid a blank or unreadable screen at power-up. 2. Use the Setup Utility to manually set the video refresh rates to the highest ergonomic refresh rates supported by the display. Refer to display monitor's User's Guide for specifications.
0B0x	Missing Microcode Update	Your system is missing the Microcode Update data block for the microprocessor. Your must correct this problem to avoid possible malfunction or reliability problems. To correct this: 1. Update your BIOS by running the flash utility from you Navigator CD-ROM. To do this, insert the Navigator CD-ROM in the CD-ROM drive and power-cycle your system. 2. If updating your BIOS does not clear this error, contact your service representative.
0B1x	Failed to load Microcode Update	Your system has failed to load the Microcode Update data block for the microprocessor. Your must correct this problem to avoid possible malfunction or reliability problems. To correct this: 1. Update your BIOS by running the flash utility from you Navigator CD-ROM. To do this, insert the Navigator CD-ROM in the CD-ROM drive and power-cycle your system. 2. If updating your BIOS does not clear this error, contact your service representative.
0B2x	Defective Microcode Update	The Microcode Update data block for the microprocessor is defective. To correct this: 1. Update your BIOS by running the flash utility from you Navigator CD-ROM. To do this, insert the Navigator CD-ROM in the CD-ROM drive and power-cycle your system. 2. If updating your BIOS does not clear this error, contact your service representative.

Code	Description	Problem/Solution
0B3x	Processor Module conflict	POST has detected the processor modules installed in the server are not the same type or speed.
		To correct this:
		2. Ensure both processor modules in the server have the same product code, which should include the type, heat sink, and speed.
		3. If not, replace one or both to ensure both are the same product code.
		This problem must be corrected to avoid possible malfunction or reliability problems.

Beep Codes

If the POST routines cannot display messages when an error occurs before the video display is initialized, the server emits a series of beeps. This means that if on boot you get a blank screen, but hear beeps, you should refer to Table 5-2 to interpret the beeps.

Beep Codes for Fatal Errors

P = Check and replace processor module

S = Check and replace system board

M = Check and replace memory modules

Table 5-2. Beep Codes

Beep Code	Test Failure	I/O port 80H	Repair
1-2	Check for option ROMs. Checksum failure	98	S
1-2-2-3	BIOS ROM checksum	16	S
1-3-1-1	Test DRAM refresh	20	S, P
1-3-1-3	Test 8742 Keyboard Controller	22	S, P
1-3-4-1	RAM failure on address line xxxx*	2C	M, P
1-3-4-3	RAM failure on data bits xxxx* of low byte of memory bus	2E	M, P
2-1-2-3	Check ROM copyright notice	46	S
2-2-3-1	Test for unexpected interrupts	58	S

* xxxx indicates the address line or bits that failed.

If you still don't see anything and:

1. If you press F1 and nothing happens, confirm the following:

   a. The keyboard cable is properly connected to the keyboard and the keyboard port.

   b. The keyboard is not locked, and network server mode is not enabled. (If either the keyboard lock or network server mode was enabled in the Setup Utility, type in the password.)

2. If the server beeps several times and does not display an error message, the server has experienced a fatal POST error. If this happens, turn off the system, unplug the power cords, and do the following:

   a. Remove and reinsert all server PCAs and accessory boards firmly in their slots.

   b. Remove and reinsert the CPUs firmly in their sockets in the system board.

   c. Remove and reinsert the memory modules firmly and correctly in their sockets.

6 Troubleshooting

Preventive Maintenance Procedures

Refer to the following table for preventive maintenance procedures used for the HP Tower Server tc3100. Be sure to turn off power to the server when cleaning it.

Preventative Maintenance Procedures

Component	Time Frame	Maintenance Procedure
Keyboard	Regularly	Dust with a damp, lint-free cloth. Lock the keyboard if there is that option on the HP Server; otherwise, power off the HP Server before cleaning.
Monitor screen	Regularly	Use HP Video Screen Cleaner or other appropriate monitor screen cleaner.
Mouse	Regularly	The ring surrounding the trackball on the bottom of the mouse opens and closes. Remove the ring and keep the trackball free of dirt. Do not use solvent to clean. Use a damp, lint-free cloth.
Tape drive heads	Monthly	Use the recommended cleaning method noted in the device's manual.
Cooling fans and grilles	6 Months	Check functions of cooling fans and clean the intake openings on the chassis. Be sure to power off and unplug the HP Server before cleaning. Use an industrial static-free vacuum cleaner to remove the dust and lint.

CAUTION	Do NOT use petroleum-based cleaners (such as lighter fluid or cleaners containing benzene, trichlorethylene, ammonia, dilute ammonia, or acetone. These chemicals could damage the keyboard's plastic surfaces. .)

HP recommends the periodic cleaning of tape drive heads, capstans, and guides on the HP tape drive units and those products using high-density data cartridges and mini-data cartridges. This maintenance procedure prolongs tape and head life and helps reduce read/write errors due to dust and oxide. Call the HP Customer Support Center or check HP's Storage website for further information for preventative maintenance information on the HP tape drive.

Troubleshooting Tools

If you are having problems installing your HP Server, there are a number of tools available for troubleshooting.

The HP Server Online Documentation CD-ROM contains the following tools:

- Troubleshooting Information
- Parts Information
- List of Error Messages
- List of Beep Code Error Messages

HP Server Navigator CD-ROM (only available for specific HP Server models) provides several utilities for troubleshooting purposes. At the Main Menu, select "Server Utilities" to use the following tools:

- Diskette Library - A collection of diskette images representing drivers, utilities, and BIOS updates, which enables you to conveniently generate any flexible disk available on the HP Server Navigator CD-ROM.

- HP DiagTools Utility - An easy-to-use hardware diagnostic for HP Server verification and rapid troubleshooting. Use this image to copy DiagTools to two (2) flexible diskettes from the HP Server Navigator CD-ROM.

- The Startup CD-ROM (only available for the HP Server tc2100 and tc2110) also provides the same DiagTools utility for troubleshooting purposes: Boot to the HP Startup CD-Rom on the HP Server and execute the utility. The HP DiagTools Utility will automatically launch.

Got to HP's web site at **www.hp.com** to access the most comprehensive support material.

- Latest support news – Product and support information on HP Servers.

- Drivers and software downloads for HP Servers.

- HP Instant Support – Fast, web-based support that is automated and provides quick diagnosis and resolution of most computing problems.

- Step-by-step guides and documents on the Instant Support site for system troubleshooting and information.

- Technical information – Data sheets, application notes, configuration guides, installation tips, product papers, reference material and more.

- Compatibility Information – HP Accessories, OS/NOS, HP and third-party products.

- Manuals – Easy installation and configuration manuals for the HP Server.

- Parts and Service – Information on replacement parts, exploded views, and configuration.

- Tape backup support – Support for HP's SureStore Tape Backup products.

Other Support Information

- HP Server Registration

- Training Programs – HP STAR worldwide training and certification program.

- Warranty and enhanced services – Your guide to services for your HP Server.

- Proactive Notification – HP will email your customer information when it is available.

- Contacts – How to get help or provide feedback.

If you need assistance, HP recommends contacting your reseller or going to the HP website first. Refer to the topics listed above. If you need immediate telephone assistance, contact the HP Customer Support Center by referring to the list of telephone numbers in the HP Server Warranty and Service/Support booklet provided with the HP Server.

Troubleshooting

WARNING	Before removing a cover, always disconnect the AC power cords. Disconnect them to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry. Disconnect the telephone cables to avoid exposure to shock hazard from the telephone ringing voltages.

WARNING	Do NOT operate the HP Server for more than 10 minutes with any cover (including power supplies and disk drives) removed. Otherwise, damage to system components may result due to improper cooling airflow. However, you can safely remove a cover while the HP Server is running to remove and replace PCI hot-plug boards. For any other service activity requiring access to the system board or power distribution board, power down the HP Server and observe all safety precautions.

- For problems with the disk array controller board, refer to the appropriate HP NetRAID manual.

- For problems with the HP Instant Toptools, refer to the HP Instant Toptools Administrator Guide on the HP website at:

www.hp.com/toptools

- For general information on HP Server products, refer to:

www.hp.com and search for the specific product. These instructions do not generally cover third-party components or devices. Refer to the documentation that comes with the third-party device for diagnostic and troubleshooting information.

CAUTION	Always wear an antistatic wrist guard when working inside the HP Server.

- Ensure the HP Server is properly configured. Many HP Server problems are the result of incorrect system and SCSI subsystem configuration settings.

- Check the system BIOS Setup Utility by pressing F2 during the boot process.

- Check the SCSI configuration or the disk array configuration by entering the controller's setup utility.

- Boot to the HP Server Navigator CD or Startup CD for access to configuration tools to help setup the HP Server.

- If it is a network-related error, determine if the user has enough memory and hard disk drive capacity. Run the diagnostics for the NIC. Consult with the network operating system manual.

- If it is a hardware error, follow the instructions to log users off the LAN and power down the HP Server. Reboot and watch for any POST error messages and listen for any beep codes as the HP Server goes through POST then look up the error message in Chapter 5 of this Service manual. If the HP Server passes POST, the HP DiagTools Utility can be used to further test the hardware.

- Use HP DiagTools Utility whenever possible to detect hardware problems. Insert the *HP Startup CD-ROM* into the CD-ROM drive and reboot the HP Server. Run HP DiagTools from the Startup CD-ROM and verify the Server's hardware integrity.

Besides HP Server DiagTools, use the standard set of tools recommended for troubleshooting:

- HP Server Assistant (NSA): This is a customizable software toolset that helps monitor and manage HP Servers over the network from and HP OpenView console. The NSA software has a server part and a management console, or client part.

- Toptools: HP Instant Toptools provides a set of web-based management tools that can be used to maintain and control the HP Servers that are running Microsoft Windows 2000, Novell NetWare/IntranetWare, or SCO UNIX.

Troubleshooting Checklist

1. Verify the error. Make sure it is not an erroneous error message. Is the error repeatable? Is the error message seen affecting the HP Server's operation or performance?

2. Always change only one component at a time.

3. Always check the most recently added items added, both hardware and software. Remove any third-party components.

4. Make sure the HP Server BIOS is updated to the latest version posted to HP's external website. Flashing/updating the system BIOS and clearing CMOS will resolve many different issues.

5. Make sure the firmware for the hard drives are kept current. Download and run the Hard Disk Drive Firmware Utility to verify if hard drive firmwares need to be updated. This utility is available from HP's external website.

6. Make sure all firmware/BIOS revisions on any controllers are kept current.

7. Use only HP-provided drivers for any HP devices used in the HP Server. This includes using HP drivers for the initial installation of any NOS (Network Operating System) that is supported on the specific HP Server.

8. Check all cable and power connections, including those in the rack. If the HP Server is not powering on, unplug the AC power cords and wait 20 seconds then plug the AC power cords in again and restart the HP Server. Check for normal operation.

9. Verify that all cables and boards are securely plugged into their appropriate connectors and slots.

If the problem still persists:

10. Simplify the HP Server's configuration. The minimum required:

    o   Monitor

    o   Keyboard

    o   Mouse

    o   1 hard drive (may need to disconnect for hardware troubleshooting)

    o   CD-ROM and Flexible disk drive (may need to disconnect for hardware troubleshooting)

11. Reconnect the power cords and power on the HP Server. If operational, power back down and reinstall one component at a time and power on the HP Server after the installation of each component to try and determine which component is causing the problem.

If the problem persists, call the HP Customer Support Center for further troubleshooting assistance.

BIOS Reset/Update/Recovery

Should you experience compatibility or stability issues with the HP Server, HP recommends starting the troubleshooting by first updating the system BIOS, which may fix the current problem. If the BIOS has become corrupt, it is possible to perform a BIOS reset, recovery, or update to correct the condition. A BIOS update/recovery diskette is created when the most current BIOS is downloaded from the HP Web site to be used in flashing the BIOS on the server. To perform a reset, an update, or a BIOS recovery, perform one of the following procedures.

BIOS Reset

If the HP Server needs the BIOS settings set to the factory defaults (the HP recommended values) due to possible corruption, perform the following steps. The default values have been selected to optimize the HP Server's performance.

NOTE	It is recommended that the system's setup and configuration settings be noted before resetting the system to the defaults in the BIOS Setup Utility.

1. Reboot the HP Server in a normal manner and press <F2> to enter the BIOS Setup Utility.

2. Press <F9> to load default values.

3. Press <F10> to save changes and exit the BIOS Setup Utility.

BIOS Update/Recovery

Use this procedure to update the HP Server system BIOS with the latest BIOS version. HP regularly posts a new version of the HP Server BIOS on the website to improve the HP Server's performance.

1. Provide a blank, formatted 3 ½" floppy disk.

2. Insert this diskette to any Windows PC with HTML browser and a connection to the Internet.

    http://www.hp.com

3. Locate and download the latest HP Server BIOS to the PC's hard drive. Find the file that was downloaded and double-click on the file and follow the instructions to extract the file to the floppy disk. This downloaded BIOS on the diskette becomes the BIOS update diskette.

4. Boot the HP Server with the BIOS update diskette in the flexible disk drive. The BIOS Utility Update program will start and you will be prompted to update the system BIOS.

5. After the BIOS update is complete, remove the BIOS update diskette and then reboot the HP Server.

6. Press <F2> to enter the BIOS Setup Utility and make the necessary changes needed in the BIOS Setup Utility, press <F10> to save the changes and exit the utility.

7. Label, date, and save this flexible diskette for use as a BIOS Recovery diskette.

NOTE	If you do not have convenient access to the Internet, you can create a BIOS Update/Recovery diskette from the *HP Navigator CD-ROM or the HP Startup CD-ROM*. Please note that these CD-ROMS may not provide the most recent BIOS. To create the BIOS Update/Recovery diskette, run the *Navigator or Startup CD-ROM* on any Windows PC with an HTML browser and follow the menu instructions.

Clearing the BIOS Configuration

NOTE	It is recommended that the system's setup and configuration settings be noted before clearing the BIOS configuration as this will reset all settings back to the default.

You may need to clear the BIOS (CMOS) configuration if the configuration has become corrupt or if incorrect settings made in the Setup Utility have caused error messages to be unreadable.

To clear the configuration:

1. Turn off power to the HP server and open the side panel.

2. Move switch 4 in the configuration switch on the system board (labeled "Clear CMOS") to the ON position.

Configuration Switch Settings
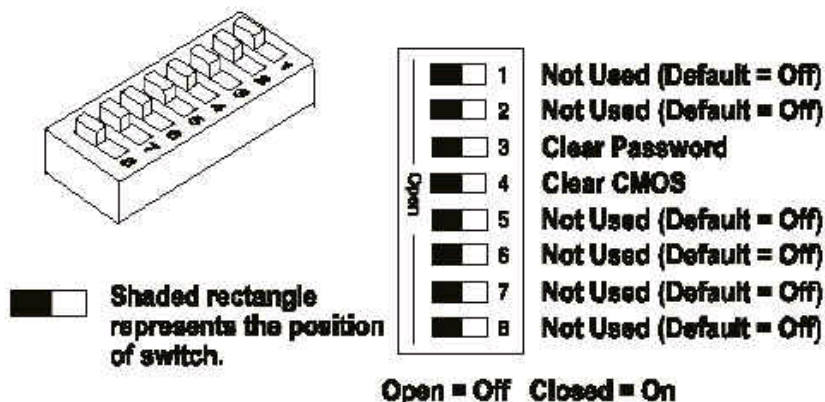
3. Turn on the power to the HP server. A message displays indicating the configuration has been cleared.

4. Turn off power to the HP Server.

5. Return switch 4 on the system board to the **OFF** position.

6. Close the side panel.

7. Turn on the power to the HP server and the following message displays:

o   Incorrect System Configuration

8. Press F2 to run the BIOS Setup Utility.

9. Make any configuration changes required.

10. Choose the Exit option and save the changes to save the configuration and exit the Setup Utility.

Password Problems

The only way to resolve the issue of a forgotten Supervisor password is to clear the password by using the appropriate dipswitch on the system board. Refer to the previous section for location of the password dipswitch. ..

Supervisor Password

1. Power off the HP Server. Remove the covers and locate the password dipswitch and move to the opposite position.

2. Power on the HP Server. When the memory count appears on the screen, power off the HP Server.

3. Move the password dipswitch back to the original position.

4. Power on the HP Server. The system BIOS Setup Utility will allow access to it now without having to enter any password.

5. A new Supervisor password can now be set from the system BIOS Setup Utility.

User Password

If you need to reset the User password and you know the Administrator password, perform the following steps:

1. Restart the HP Server.

2. During the boot process, press F2 to start the system BIOS Setup Utility.

3. Enter the Administrator password and once in the Setup Utility, go to the Security menu.

4. Scroll to the User Password field, and press ENTER on SET USER PASSWORD.

5. Enter the Administrator password as the old/current password and press ENTER.

6. Enter the new User password and press ENTER.

7. Reconfirm the new User password and press ENTER. This sets a new User password.

8. Exit out of the Setup Utility and save the changes to save the new password.

NOTE	If you have forgotten the Supervisor or the User, your HP Server will function normally, but you will not be able to access the system BIOS Setup Utility until the password dipswitch is moved and reset.

"Operating System Not Found" Message Appears

At the end of POST, if the HP Server states "Operating System Not Found", check the following:

1. Check for a non-bootable diskette in the flexible disk drive. If found, remove the diskette from the disk drive.

2. Check for a tape in the tape drive. If found, remove the tape cartridge from the drive.

3. Power on the HP Server. If the message still appears, reboot the HP Server and when prompted, enter the system BIOS Setup Utility and check that the device boot order is correct.

4. If a disk array controller is being used and the NOS is installed on a hardware array/container, verify that the array/container is in an optimal state by accessing and checking the disk array controller's setup utility during startup.

5. Boot to a DOS boot disk and check the partitions to make sure the primary partition is active.

If the problem persists, contact the HP Customer Support Center for further troubleshooting assistance.

Server Stops or Hangs While Starting Up

Typically, if the HP Server hangs before the end of POST completes, the problem is possibly a hardware problem or failure. If the HP Server hangs after POST completes, the problem is possibly due to an incorrectly configured or corrupt driver, operating system, application program, or a media (disk drive) error.

If the HP Server stops working or hangs starting up:

1. Review the Troubleshooting Checklist at the beginning of the chapter before continuing.

2. Try to verify exactly where the HP Server is stopping during POST. For example: is the HP Server stopping at the memory count or on a SCSI controller? Look for any error messages and listen for any beep codes and make note of them for further assistance in troubleshooting the problem.

3. If the failure persists, verify there is not a hardware problem by running HP DiagTools.

If the problem persists, contact the HP Customer Support Center for further troubleshooting assistance.

Power Problems

NOTE	The installation of the HP Server Remote Management Card (optional accessory) changes the Power Supply Status LED behavior on the front panel. See Chapter 1 Front Panel LED Indicators in this manual.

NOTE	The HP Server tc3100 supports the ACPI (Advanced Configuration and Power Management Interface) standard, which is a key component of a NOS's directed power management. The supported features are only available when an ACPI-compliant NOS is installed on the Server.
	Refer to Chapter 1 in this manual BEFORE doing any further troubleshooting to verify that the HP Server tc3100 is not in a sleep mode.
	A blinking green power LED indicates the HP Server tc3100 is in a sleep mode.

1. Verify the HP Server's power cord is plugged in to a known good power source.

2. Is the On/Off/Sleep LED on the front of the HP Server tc3100 a steady green, which indicts it is getting power?

3. Remove the HP Server form any UPS or PDU and connect the HP Server directly to a power source.

4. Verify the AC power source is good:

    a. Verify the circuit breaker for the AC power outlet.

    b. If the breaker was off, verify all devices connected to the HP Server share the same circuit breaker and are the only devices on it.

    c. Reset the circuit breaker after reconfiguring the devices if needed.

    d. Verify the AC power outlet is not faulty by plugging in a known good device.

e. Verify the DC power supply cable connected to the system board.

4. If the fans (system, power supply, and processor heat sink) are not audible and the above steps are verified:

a. Disconnect the power cord/s for five minutes in order to reset the power supply's circuitry.

b. With the power cord/s disconnected, remove the HP Server cover.

CAUTION	Always wear an anti-static wrist guard when working inside the HP Server.

c. Remove all the accessory boards, including any hard disk drive controller board or video board. Disconnect all mass storage power cords and cables.

d. Plug the power cord/s back in and turn on the HP Server.

e. If power is still not getting to the HP Server, the power supply may be faulty.

Contact the HP Customer Support Center for further assistance before replacing any parts.

Video/Monitor Problems

NOTE	The HP Server tc3100 supports the ACPI (Advanced Configuration and Power Management Interface) standard, which is a key component of a NOS's directed power management. The supported features are only available when an ACPI-compliant NOS is installed on the Server.
	Refer to Chapter 1 in this manual BEFORE doing any further troubleshooting to verify that the HP Server tc3100 is not in a sleep mode.

A blinking green power LED indicates the HP Server tc3100 is in a sleep mode.

These are basic guidelines for troubleshooting video issues. They are arranged in such an order as to be used progressively. The HP Server should not be re-populated with components until video is produced. For each step taken, be certain to unplug the power for 30-60 seconds prior to powering the HP Server back on. For each power up attempt, allow at least 60 seconds for the HP Server to produce video.

| **NOTE** | Take appropriate electrostatic discharge precautions prior to working inside the HP Server. |

| **NOTE** | If using a third-party video controller card and the onboard video controller (if applicable) was disabled, remove this controller card, connect the cable to the onboard video controller then clear the CMOS. This re-enables the onboard video. For instructions on clearing CMOS, refer to the section on this earlier in this chapter. |

1. Test the monitor on another machine to verify the monitor is not faulty.

2. Disconnect the HP Server from any console switch box during troubleshooting. Connect a known good monitor, keyboard, and mouse to the HP Server to troubleshoot.

3. Verify that the AC power source is good. If suspect, try another power source.

| **NOTE** | Verify that fans and hard drives are spinning up. If no fans or drives are spinning up, see previous section on Power Problems. |

If there is still no video:

4. Power off the HP Server and unplug from the power source and remove the covers.

5. Locate and toggle the "CLEAR CONFIG" switch to the "ON" position.

6. At the same time, check the processor speed switches to verify that they are set correctly.

7. Plug the HP Server into a power source and power on the HP Server. Quite often, just toggling the "CLEAR CONFIG" switch will restore video.

If there is still no video:

8. Power off the HP Server and unplug form the power source.

9. Remove all PCI controller cards.

10. Disconnect power and SCSI connections from tape drives and hard drives.

11. Disconnect IDE and flexible disk drive cables.

12. Take the HP Server down to base memory (1 DIMM) and reseat that DIMM.

13. Plug the HP Server into a known good power source and power on the HP Server.

14. If video returns, reinstall the removed components one at a time back into the HP Server. One of the removed components may have been causing the no video problem.

15. After all the components are reinstalled, reset the HP Server's BIOS configuration switch back to the appropriate setting.

If the problem persists, contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Configuration Problems

The Configuration Cannot Be Saved and the Battery Loses Power or the Configuration Information is Frequently Lost

WARNING	There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

NOTE	Configuration information is saved in the CMOS on the system board. The CMOS battery is the power source that saves this information.

1. If the HP Server frequently loses the time and date, clear the CMOS and flash the system BIOS to the latest revision. See the previous section in this chapter for Clearing the BIOS configuration and updating the system BIOS.

   o After performing the BIOS flash, on reboot, enter the BIOS Setup Utility (<F2> during POST when prompted) and set the date and time.

   o Exit out of the BIOS Setup Utility making sure to save changes before exiting.

   o See if this resolves the issue.

2. If this does not resolve the issue, boot to the Navigator CD and set the date and time from the appropriate menu. See if this resolves the issue.

3. If this does not resolve the issue, replace the CMOS battery. The battery is attached to the system board.

   o Turn off AC power to the HP Server.

   o Unplug the HP Server's power cords from the power source.

   o Remove the covers and locate the CMOS battery on the system board and replace the battery.

   o Power on the HP Server, and set the date and time from the BIOS Setup Utility (<F2> during POST when prompted).

   o Exit out of the BIOS Setup Utility, making sure to save changes before exiting.

On reboot, see if the issue is resolved with the good battery in the HP Server. If this still does not resolve the issue, please contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Printer Problems

If the printer does not work, do the following:

1. Verify that the AC power cord is plugged into the power source and the printer.

2. Ensure the printer power switch is ON and the AC outlet is working.

3. If the printer is plugged into a multiple-outlet box, make sure the switch on the outlet box is turned on and the circuit breaker (if applicable) is not tripped.

4. Ensure the printer is online and available for printing.

5. Verify the correct cables are being used and that the cables are connected properly. Make sure the cable pins are not bent.

6. Try a known good cable.

7. If the printer's parallel date cable is plugged into the HP Server after the server is on, reboot the HP Server.

8. Examine the printer for a paper jam.

9. Run the printer self-test. Refer to the printer's manual for instructions.

10. Ensure the correct port setting when configuring the printer.

11. Run the system BIOS Setup Utility (<F2> on POST when prompted) to verify the I/O port status. Make sure it is not disabled.)

12. Test another peripheral from the HP Server's parallel port to ensure functionality.

If the printer still does not work, contact the HP Customer Support Center for further assistance.

The Keyboard Does Not Work

NOTE	Use only an HP-Approved Keyboard as others may not work correctly.

If the keyboard does not work or a character is not displayed when a key is pressed:

1. Ensure that the keyboard is not locked, if the HP Server has this feature.

2. Ensure that the keyboard cable connections at the rear of the HP Server and at the back of the keyboard are secure.

NOTE	Make sure the keyboard is plugged into the keyboard port and not into the mouse port in the back of the server.

3. If the KVM switchbox is used with this HP Server, remove the keyboard and plug the keyboard directly into the keyboard port of the HP Server.

4. Try replacing the keyboard with a known good keyboard, and then reboot the HP Server.

5. If there is a keyboard extender cable, make sure the connection is secure or remove the extender and plug the keyboard directly into the HP Server.

If the problem persists, contact the HP Customer Support Center for more troubleshooting steps before replacing any parts.

The Mouse Does Not Work

The HP Server automatically detects a mouse when one is installed. If the mouse or other input device is not working, check the following:

1. Verify that the mouse cable is properly and securely connected to the HP Server or KVM switch box.

2. If a KVM switch box is used with this HP Server, remove the mouse and plug the mouse directly into the mouse port on the HP Server.

NOTE	Make sure the mouse is plugged into the mouse port and not the keyboard port.

3. Ensure that the mouse port does not have a resource conflict with another device. Use the system BIOS Setup Utility (F2) to check.

4. Ensure that the correct mouse driver has been installed onto the boot drive. Refer to the mouse installation manual or the operating system manual.

5. Replace the mouse with a known good mouse.

If the problem persists, the system board may need to be replaced. Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Flexible Disk and Flexible Disk Drive Problems

If the HP Server cannot boot from, write to, or format a flexible disk, do the following:

1. Try booting from a known good flexible disk.

2. If there is a bootable CD in the CD-ROM drive, remove it. By default, the CD-ROM drive is first in the boot order, so if there is a CD-ROM disk in the drive, the HP Server will not boot to a bootable flexible disk.

3. Select the system BIOS Setup Utility (<F2> on POST when prompted) and verify the mass storage configuration is correct.

NOTE	If for some reason the system BIOS Setup Utility cannot be accessed, clear the CMOS. See Clearing BIOS Configuration previously in this chapter.

4. Ensure the disk is not write-protected.

5. Ensure that the disk drive is trying to be accessed. Look for an activity light on the drive.

6. Try another flexible disk.

7. Boot to the HP Navigator CD and try creating a disk form the Diskette Library. This will eliminate the NOS causing the problem since the Navigator is only using DOS.

Flexible Disk Drive Problems

1. Verify that the internal drive cables are securely attached and functional by inspecting the cables and reseating the connections at both ends.

2. If the cables are securely attached and the drive still does not work, replace the cable with a known good cable.

If the problem persists, call the HP Customer Support Center for further assistance before replacing any parts.

CD-ROM Problems

The CD-ROM Drawer Will Not Open

If the CD-ROM drawer fails to open when the Eject Button is pressed or with software commands, do the following:

1. Turn off the HP Server.

2. To open the drawer, inset a pointed object, such as a paper clip, into the emergency eject hole and push in about 1.75 inches (40 mm).

Insert paper clip
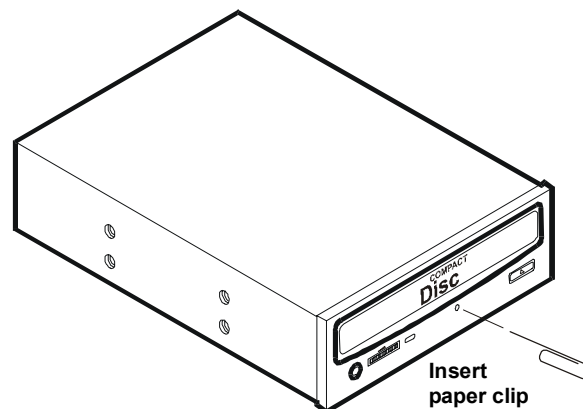
3. Remove the disk and close the drawer.

4. After the disk is removed, start the HP Server and try to open the drawer again with the Eject Button or software command.

If the drawer still will not open, call HP Customer Support for further assistance before replacing any parts.

The CD-ROM Drive is Not Working Properly

The CD-ROM drive provided with all the HP Server models is an IDE CD-ROM. If the CD-ROM drive does not work, do the following:

1. Review the basic IDE installation guidelines to ensure a proper configuration.

2. In addition, check the following:

   o Verify correct drivers are installed.

   o Verify there is a CD-ROM disk in the CD-ROM drive.

   o Verify the IDE Controller and devices are displayed during Power On Self Test (POST).

   o Verify all internal drive cables are securely attached and functional.

3. Verify that the Local Bus IDE Adapter item is correctly configured in the Setup program:

   o Power on the HP Server and press F2 to enter the BIOS Setup Utility when this option displays.

   o Check that **Both** is selected in the Local Bus IDE Adapter field.

If the problem persists, contact the HP Customer Support Center for further troubleshooting steps before replacing any parts.

NOTE	Check for Environmental Problems That Could Damage Disk Media and Disk Drive Heads.

Environmental problems result from:

- Radiated Interference: sources include communications and radar installations, radio/TV broadcast transmitters, and hand-held receivers.

- Airborne contaminants: Sources include dust, smoke, and ashes. Steam from duplication equipment may result in intermittent disk errors.

Server Will Not Boot From a CD-ROM Disk

1. Verify the CD-ROM disk is bootable.

2. Use the BIOS Setup Utility to verify that the CD-ROM Drive is first in the boot order. To do this:

   o Reboot the server and run the (BIOS) Setup Utility (pressing F2).

   o Scroll to the Boot menu.

   o If necessary, move the CD-ROM up in the boot order list. This ensures the CD-ROM will boot before any of the hard disk drives (IDE or SCSI).

   o Save and exit the Setup Utility.

If the problems persists, contact the HP Customer Support Center for further troubleshooting assistance.

SCSI Problems

The SCSI Boot Controller BIOS Has Trouble Loading The Boot Logical Drive (NOS drive)

1. Verify the SCSI boot controller is bannering (displaying) on POST.

2. Ensure that the SCSI boot controller's BIOS is enabled. Check this from the SCSI Setup Utility. To access this utility, enter CTRL C when a Symbios controller banners on POST or CTRL A when an Adaptec controller banners on POST.

3. Determine what the boot order is for the HP Server. To verify that the SCSI boot controller board is in the correct position in the boot order, enter F2 on POST to access the system BIOS Setup Utility. The boot order can be viewed and changed from this utility. If necessary, change the slot (if applicable) that the SCSI controller is in to change the location in the boot order.

4. If the problem persists:

   a. Clear CMOS and flash the system BIOS. See instructions previously in this chapter on the proper procedure to do this.

   b. Repeat step 3.

5. If you installed more than one SCSI controller, try disabling the BIOS on all other SCSI controller except for the SCSI boot controller. This lets the SCSI BIOS for the boot controller load and prevents conflicts with other SCSI controllers. If necessary, remove all the other SCSI controller boards except the SCSI boot controller until the issue is resolved.

Contact the HP Customer Support Center for further troubleshooting assistance.

A SCSI Controller Does Not Work At Initial Installation

Many SCSI controller problems are caused by an incorrect configuration rather than by faulty hardware. If the SCSI controller does not work after installation, do the following:

1. Verify the SCSI controller BIOS is bannering (displaying) on POST.

2. If more than one SCSI controller was installed, verify that each adapter is set to a separate BIOS address or disable the BIOS on all of the other adapters except the boot controller.

3. Make sure there are no resource conflicts.

4. For each device on the SCSI controller, check:

   o Each device has a unique SCSI address.

   o Do not set any device to SCSI ID 7. This is usually the controller SCSI ID.

If the SCSI banner still does not banner on POST, check the following:

NOTE	Wear an anti-static wrist guard when working inside the HP Server.

1. If the SCSI controller is an adapter board:

   a. Power off the HP Server. Unplug the power cord from the power source and remove the covers.

   b. Reseat the SCSI controller board in its slot.

   c. Replace the covers, plug the power cords back into a power source, and power on the HP Server.

2. If the SCSI controller still does not banner on POST:

   a. Do all the previous to power off the HP Server then move the SCSI controller board into another slot.

   b. If this still does not resolve the issue:

   o Clear CMOS (See the previous instructions in this chapter on Clearing the BIOS Configuration.)

   o Flash the system BIOS (See the previous instructions in this chapter on System BIOS Update.)

Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

A SCSI Device Stops Working

If a SCSI device stops working:

1. Verify it banners on POST or is seen in the SCSI Select Utility.

2. Run DiagTools and verify:

    a. SCSI Ids and any relevant switch settings.

    b. SCSI bus information.

3. If an accessory board was added recently, check for a resource conflict between the new board and an existing accessory boards.

    a. Remove the board and restart the HP Server.

    b. If this corrects the problem, the new board is either defective or it is trying to use a system resource used by another SCSI controller board.

    c. Try the accessory board in another slot.

4. Check for any recent changes or upgrades to the software. For example, has anyone moved, removed, or changed the configuration files or drivers? Refer to the software documentation for more information.

5. If you suspect hardware failure and there are no system error messages, check each component associated with the failure. Equipment failure is probably the most unlikely reason for a SCSI device failure.

Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

A SCSI Device Does Not Work After Installation

NOTE	The SCSI controller board supplied with some HP Servers come with a single channel SCSI controller board and cannot support internal and external SCSI devices on the same controller.

NOTE	Refer to the documentation provided with the SCSI device for any specific information regarding installation.

If a SCSI device does not work after installation, do the following:

1. If using a single channel SCSI controller for external devices, make sure not internal devices are connected on the internal channel of the SCSI controller. HP does not support using both internal and external connections on a single-channel controller, and a second SCSI controller board must be purchased for use with the external SCSI device.

2. Verify the SCSI BIOS is being executed properly. The internal and external SCSI device controllers display a banner during startup. The BIOS then checks for valid devices on the SCSI bus, and reports which devices are found. If the SCSI devices are installed and configured correctly, a list confirming the devices will banner on POST after the controller banners.

3. Verify the switch settings on the SCSI device/s are correct.

4. Verify each SCSI device is assigned a unique SCSI ID.

5. Ensure no SCSI device is set to SCSI ID 7. This SCSI address is generally used by the SCSI controller.

6. Ensure all installed SCSI controllers are configured correctly.

7. If the SCSI devices installed in an external connected to the HP Server operate in Ultra SCSI or FAST SCSI mode, this may cause a problem. The SCSI controller board and the internal SCSI devices normally provided with the HP Servers operate in Ultra 160 SCSI mode. The external SCSI devices may be slowing down or causing the internal SCSI controller board to be ineffective and therefore non-operational.

8. Check the SCSI cables for problems that may be caused by any recent HP Server maintenance, hardware upgrades, or physical damage.

9. Check the system BIOS version to ensure it is the most recently issued version. The most recent version is listed on HP's website.

10. Verify the SCSI bus is terminated at both ends. By default, HP Server SCSI controllers in external enclosures are terminated. When a device is connected to a connector on the SCSI bus, bus termination for that connector is disabled. Verify the last device on the bus is terminated

NOTE	Some tape drives do not banner on POST but will show up in the SCSI BIOS Utility for the controller and in the operating system.

Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Processor Problems

Contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

Memory Problems

NOTE	The HP Server tc3100 uses only 3.3V, 168-pin, 133 MHz, buffered, ECC, SDRAM DIMMS. The EDO DIMMS and PC 100 SDRAM DIMMS from earlier HP Server models will fit into the DIMM slots in the HP Server tc3100, but the EDO DIMMS and PC 100 SDRAM will not function properly and are not supported.

The memory modules used for the HP Server tc3100 are DIMMS.

1. Review the troubleshooting checklist from this manual before you continue.

2. If memory problems are being experienced, power the HP Server off and on gracefully. This performs a "cold" restart rather than a "warm" restart by doing a CTRL-ALT-DELETE.

3. Verify that all the DIMMS are HP DIMMS.

4. Verify that all the DIMMS are the correct HP DIMMS for this particular HP Server.

5. Verify that all the memory is counted during the Power On Self Test (POST).

6. Run the HP DiagTools memory test.

CAUTION	Wear an anti-static wrist guard when working inside the HP Server.

If the problem persists:

1. Power off the HP Server, unplug the power cord from the power source and remove the left side cover.

2. Locate and reseat the memory modules.

3. Plug the power cord back into the power source and power on the HP Server.

4. Verify that all the memory is counted during the Power On Self Test (POST).

If the problem still persists:

1. Power off the server and unplug the power cord for the power source.

2. Remove all but one DIMM.

3. Plug the power cord back into the power source and power on the HP Server.

4. If the error is not present, power off and unplug the server then add another DIMM, continuing this process until all the DIMMS are installed or a failure occurs.

5. Verify the failure by reinstalling the DIMM by itself and attempt to duplicate the error.

6. Try the faulty DIMM in another memory slot to confirm that the slot is not defective.

7. Replace the defective DIMM.

Contact the HP Customer Support Center for further troubleshooting assistance if needed.

Network Interface Card (embedded or PCI) Problems

If the HP Server cannot connect to the network and all the LEDs are lit on the NIC:

1. Verify that there are no resource conflicts between the NIC and any other accessory. Do this from the system BIOS Setup Utility (<F2> on POST when prompted).

2. Reboot the HP Server and log into the NOS.

3. Ensure the latest and correct HP drivers are being used for the NIC.

4. Ensure the port on the switch or hub (or other device) has the same speed and duplex settings as on the NIC.

CAUTION	Setting an incorrect duplex mode can degrade performance, cause data loss, or result in lost connections.

5. Test the NIC as directed in the installation tasks for each NOS. This information is in the HP Server's Installation Manual. Also check the README files on the support driver's disk.

6. Use the PING command to verify TCP/IP configuration.

    a. Ping the IP address of the default gateway. If the PING command fails, verify that the default gateway IP address is correct and that the gateway (router) is operational.

    b. Ping the IP address of a remote host (a host that is on a different subnet). If the PING command fails, verify that the remote host IP address is correct, that the remote host is operational, and that all of the gateways (routers) between this computer and the remote host are operational.

7. Directly connect two devices (with no hub, switch, or other device) using a "crossover" cable. PING the other computer's IP address.

NOTE	The PING command uses Internet Control Message Protocol (ICMP) Echo Request and Echo Reply messages. Packet filtering policies on routers, firewalls, or other types of security gateways might prevent the forwarding of this traffic.

LEDs are not lit on the NIC

No lit LEDs probably indicates a bad network cable, hub connection, or other network error.

1. Ensure that the cabling is installed correctly:

    a. Try another known good network cable.

    b. Try another network connection (another hub, switch, etc.)

    c. Connect the NIC to a known good network connection.

If there are still no lit LEDs, do the following:

2. Power off the HP Server and unplug the power cord/s from the power source. Remove the left side cover.

NOTE	The HP Server tc3100 has an integrated NIC so skip the following steps unless a PCI NIC is installed in the server.

CAUTION	Always wear an antistatic wrist guard when working inside the HP Server.

3. Locate the NIC and reseat it in its slot.

4. Replace the covers; plug in the power cord/s to a power source, and power on the HP Server.

5. If the problem persists, perform previous step 2 and 3 but move the NIC to another slot.

6. Replace the covers; plug in the power cord/s to a power source, and power on the HP Server.

If the problem persists, contact the HP Customer Support Center for further troubleshooting assistance before replacing any parts.

7   Replacing Parts

Safety Information

Follow the procedures listed below to ensure safe handling of components and to prevent harm to both you and the server:

- Use an anti-static wrist strap and a grounding mat, such as those included in the Electrically Conductive Field Service Grounding Kit (HP 9300-1155).

- Handle accessory boards and components by the edges only. Do not touch any metal-edge connectors or any electrical components on accessory boards.

- Do not wear clothing subject to static charge build-up, such as wool or synthetic materials.

WARNING	Hazardous voltages are present inside the server. Always remove AC power from the system and other associated assemblies while working inside the unit. Serious injury may result if this warning is not observed.

Service Tools Required

Service of this product may require one or more of the following tools:

- Electrically Conductive Field Service Kit (P/N 9300-1155)
- CE Peripheral Exerciser Disk Kit (45935-63210)
- Datacomm Test Hood, 9-pin (24540-60010)
- Datacomm Test Hood, 25-pin parallel (24540-60011)
- 1/4 inch Flat Blade Screwdriver
- T-15 Torx® Screwdriver

Chassis Fan

The chassis fan is mounted within the side panel of the chassis.

WARNING	Before opening the HP Server, always disconnect the power cords and unplug telephone cables. Disconnect the power cords to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects, such as tools or jewelry. Disconnect telephone cables to avoid exposure to shock hazard from telephone ringing voltages.

Note that the power switch does not turn off the standby power. Disconnect the power cord to turn off standby power. |

Use the following steps to replace the chassis fan:

1. If the server is operating, log off all users, back up files, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

3. Open the side panel.

4. If necessary, remove any accessory boards from the system board allowing clear access to the fan.

5. Squeeze the two blue tabs together and pull down slightly to release the latch from the rear panel slots.

6. Unplug the connector and lift out the fan. See Figure 7-1.
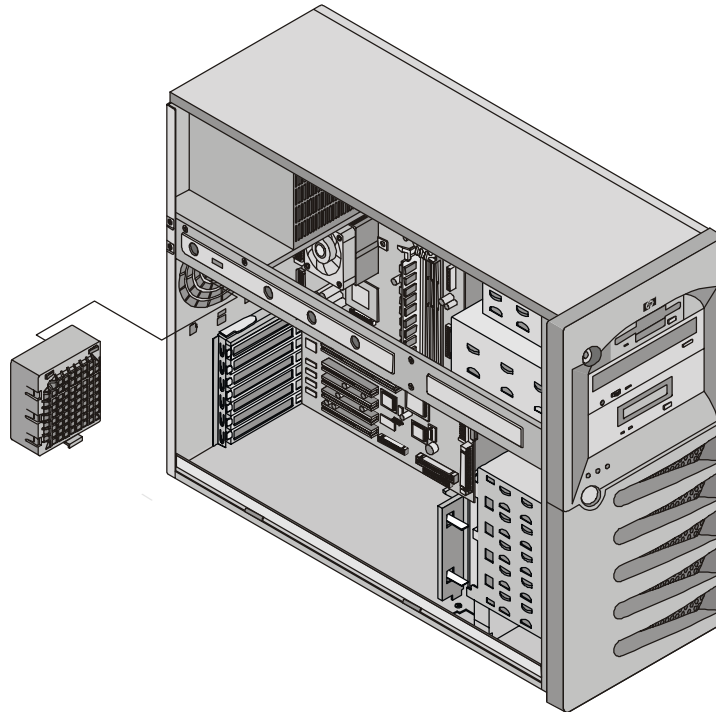
Figure 7-1. Removing the Chassis Fan

7. Remove the replacement chassis fan from the shipping container.

8. Connect the chassis fan connector.

9. Line up the tabs of the fan with the openings on the rear panel and snap the fan into place.

10. Replace any accessory boards removed to access the fan.

11. Close the side panel.

12. Replace the external cables and power cord.

13. Power up the server and return it to normal operation.

Power Supply

The low voltage ON/OFF switch on the front panel controls the power supply.

Use the following steps to replace the power supply:

1. If the server is operating, log off all users, back up files, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

3. Open the side panel.

4. Disconnect the power supply connections to the FDD, CD-ROM and optional tape drive.

5. Unplug the power cable (BP1) from the system board.

6. Remove any long PCI cards.

7. Remove the screw in front of the PCI card guide and remove the guide.

8. Unplug the power to the cold swap back plane or from the hot swap power jumper cable.

9. Remove the four screws securing the power supply to the chassis. These are located at the rear of the chassis. See Figure 7-2.

10. Slide the power supply forward and remove it.
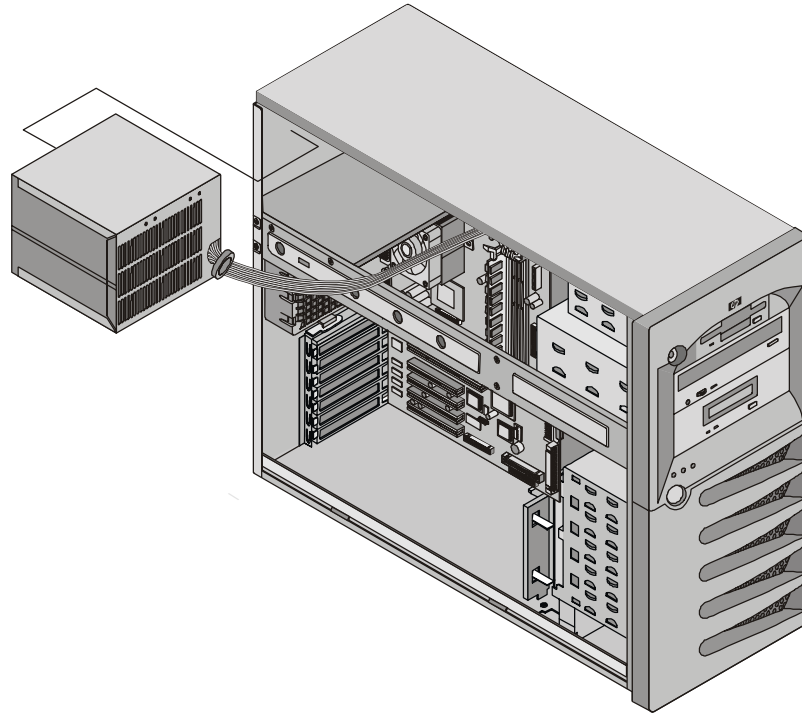
Figure 7-2. Removing the Power Supply

11. Place the new power supply into the chassis.

12. Replace the four screws securing the power supply to the chassis.

13. Connect the internal power cables.

14. Re-install the PCI card guide and tighten the thumbscrew.

15. Re-install any full length PCI cards.

16. Re-install the PCI card lock and snap the PCI card retainer shut.

17. Close the side panel.

18. Replace the external cables and power cord.

19. Power up the server and restore it to normal operation.

Battery

Use the following steps to replace the battery:

WARNING	There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

1. If the server is operating, log off all users, back up files, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

WARNING	The power supply will continue to provide standby current to the HP Server until the power cord is disconnected.

3. Open the side panel.

4. Remove any accessory boards, if necessary, allowing access to the battery socket.

5. Remove the existing battery. See Figure 7-3.

   The battery is spring loaded into the mounting socket and held in place by a latching mechanism. Press the release mechanism toward the outside of the mounting socket to release the battery.
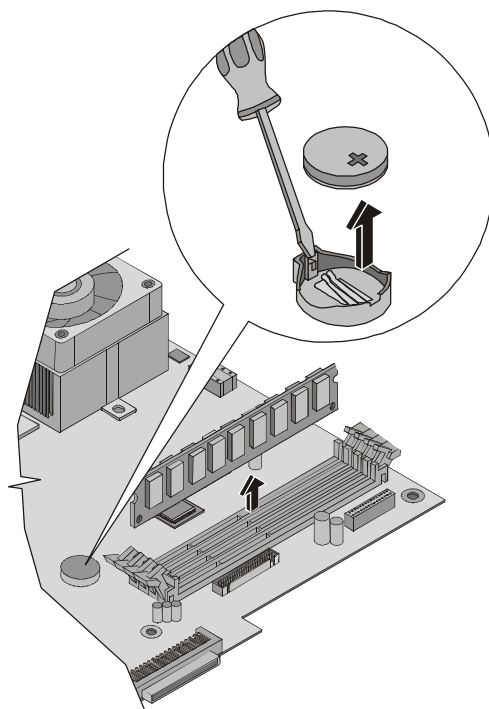
Figure 7-3. Replacing Battery

6. Insert the new battery with the positive sign (+) facing out, and ensure that it is seated completely. Ensure the retaining latch is in place, and holds the battery firmly.

7. If necessary, replace any accessory boards removed to allow access to the battery socket.

8. Close the side panel.

9. Replace the external cables and power cord.

10. Power up the server and return it to normal operation.

System Board

Use the following steps to replace the system board:

1. If the server is operating, log off all users, back up files, and power down the server.

2. Disconnect the power cord and any external cables connected to the server. If necessary, label each one to expedite re-assembly.

3. Remove the side panel.

4. Remove all accessory boards mounted on the system board.

5. Remove all cables connected to the system board. If necessary, label each one to expedite re-assembly.

6. Lay the chassis down to gain access to the system board.

7. Remove the system fan.

8. Use a Torx T-15 driver to remove the eight screws securing the system board to the chassis.

CAUTION	Use caution to prevent the T-15 driver from slipping and damaging the system board.

9. Lift the system board gently at its two front corners to unsnap the board from the chassis.

10. Slide the system board forward and then lift the board up and away from the chassis. See Figure 7-4.
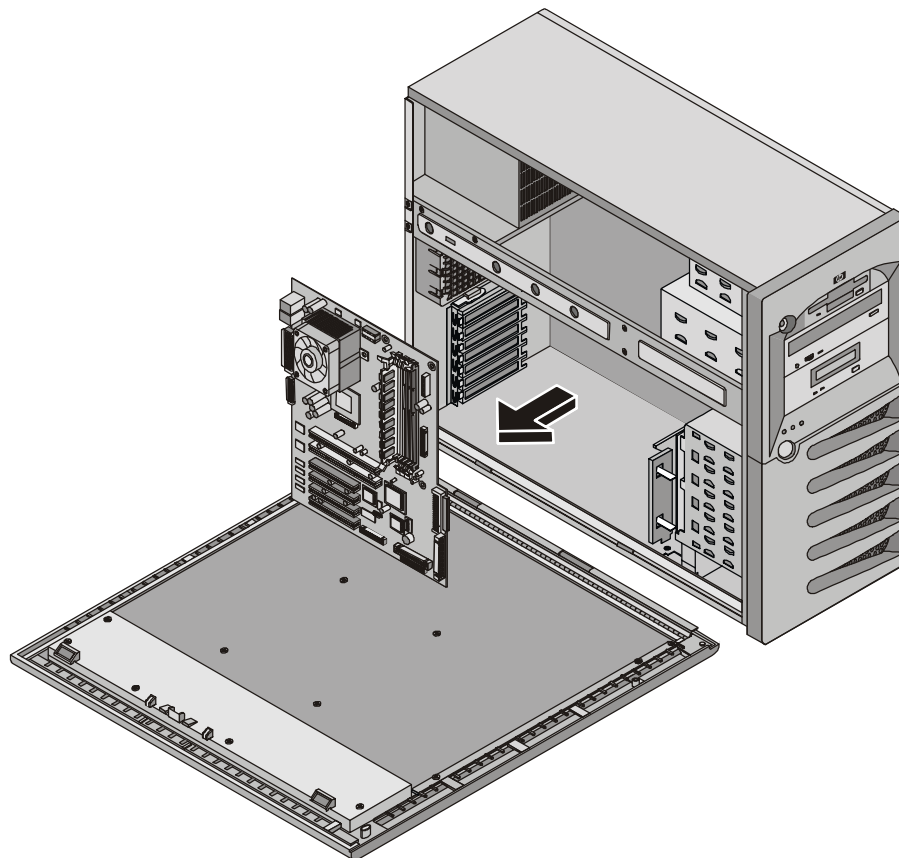
Figure 7-4. Removing System Board

11. Place the system board on an anti-static pad and record all jumper connections and settings.

12. Remove memory, processors and/or CPU terminator. Place components on an anti-static pad.

13. Place the system board and any cables in an anti-static container.

14. Remove the replacement system board and any cables from the anti-static shipping container.

15. Place the system board on an anti-static pad and set all jumper connections and settings as recorded during the system board removal.

16. Place the system board in the chassis aligning the rear panel connectors to the rear chassis and the mounting holes in the board with the holes in the chassis.

17. Snap the board into place.

18. Install the eight screws securing the system board to the chassis.

19. Replace memory, processors and/or CPU terminator.

NOTE	A tube of grease is provided with the replacement system board. One half of the tube should be used for each processor. a. Wipe the grease off of the heatsink and processor. b. Place a round dollop of the grease in the center of the CPU heat spreader. c. Push the heatsink straight down to evenly spread the grease. d. Install the heatsink to the CPU.

20. Replace all cables that were removed.

21. Replace any removed accessory boards.

22. Return the machine to its upright position.

23. Replace the system fan.

24. Connect the power cord and any external cables to the server.

25. Close the side panel.

26. Power up the server and return it to normal operation.

8   Parts Identification

Exploded View – Covers and Bezels
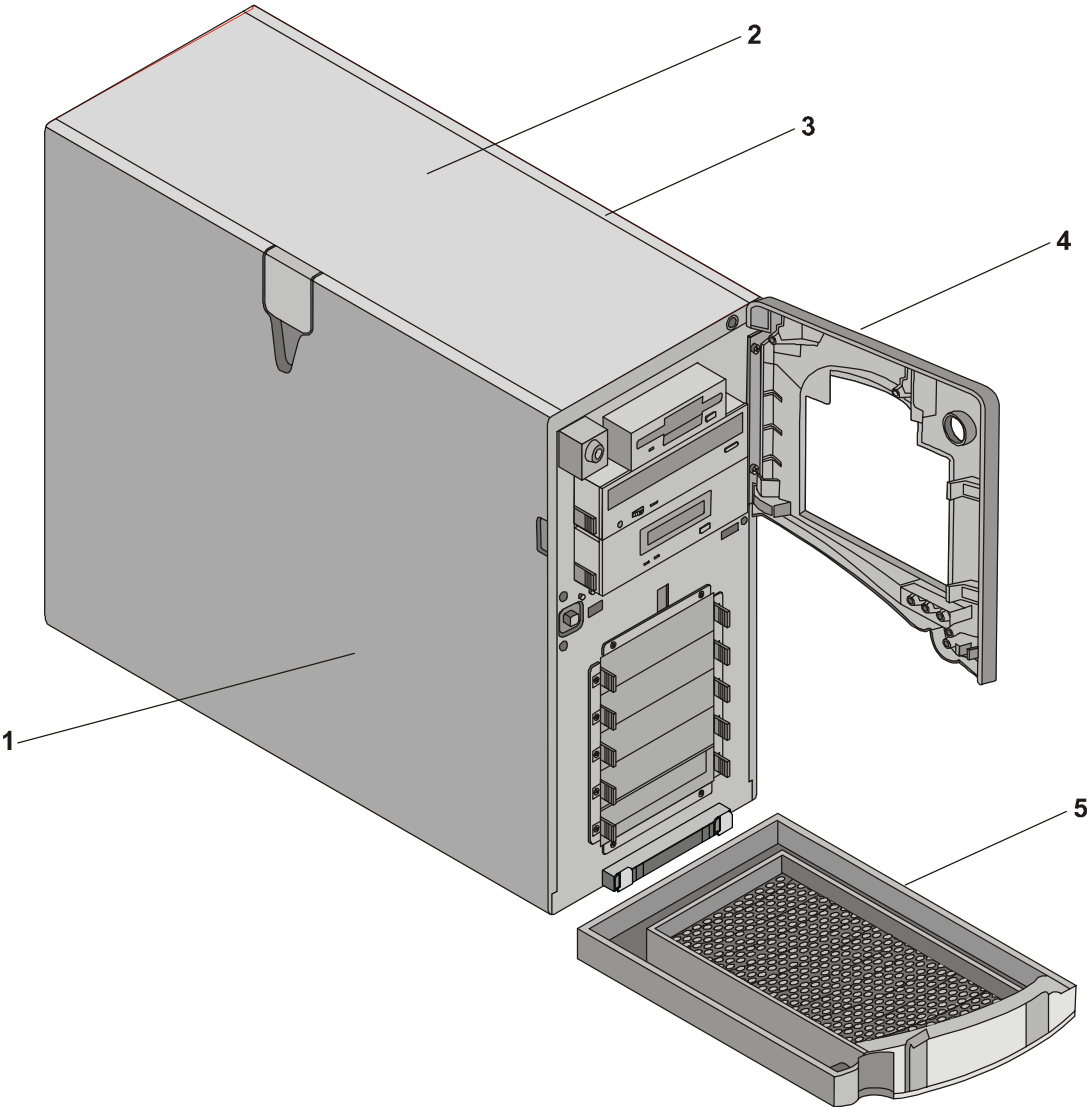
Exploded View – Drives (Cold Swap)
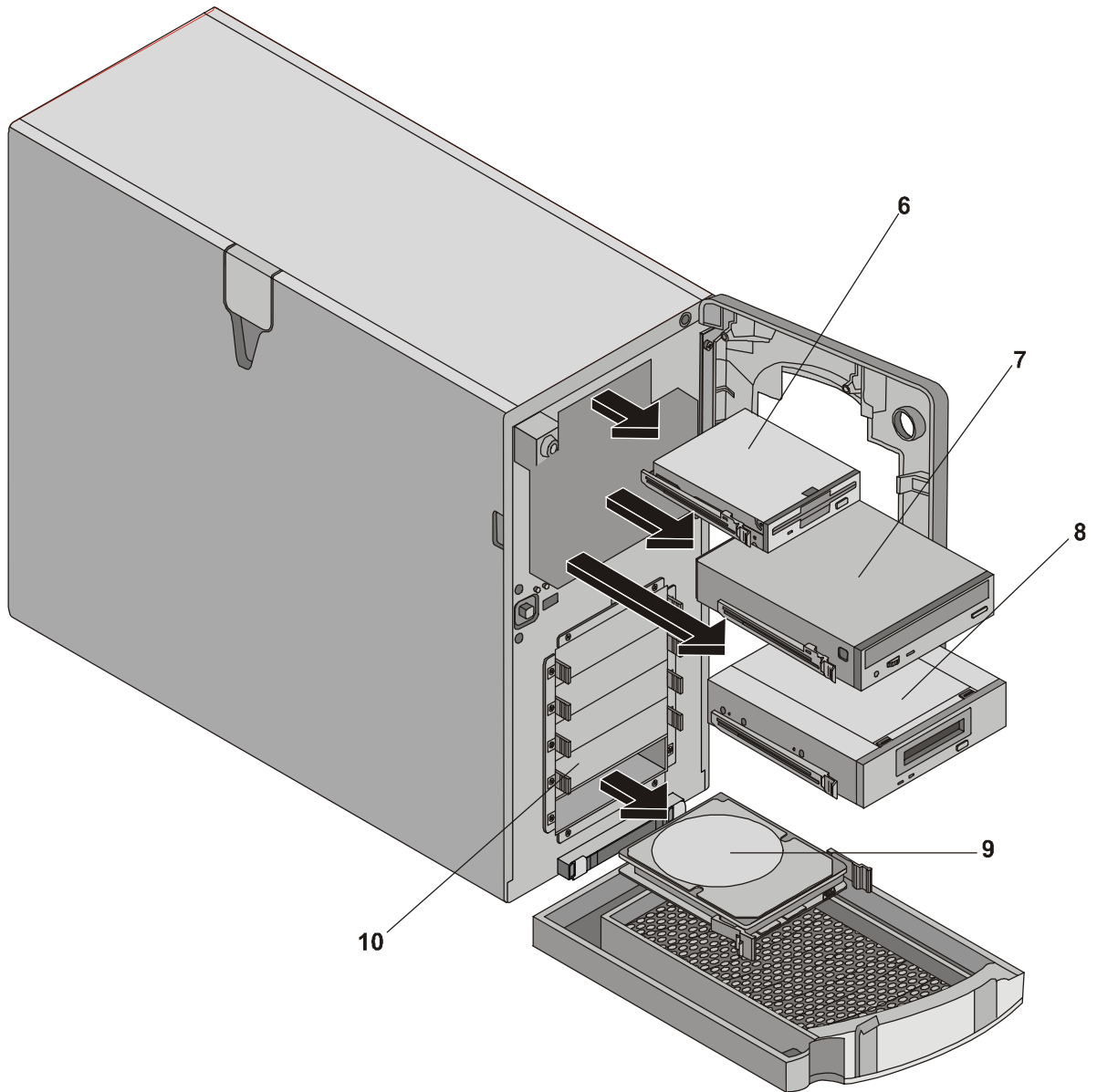
Exploded View – Drives (Hot Swap)
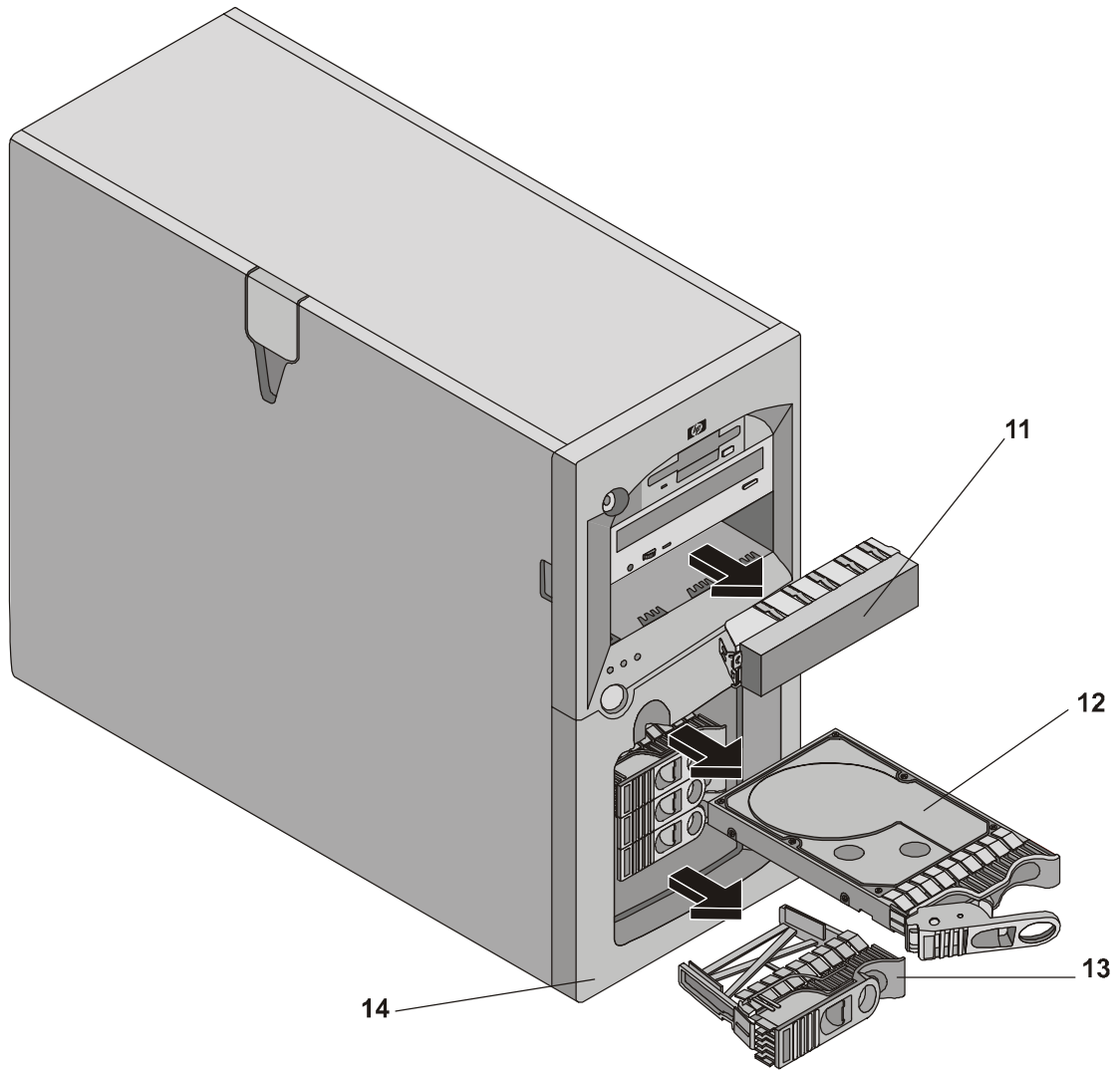
Exploded View – Power Supply, Fan, I/O Retainer, System Board

15

16

17

18
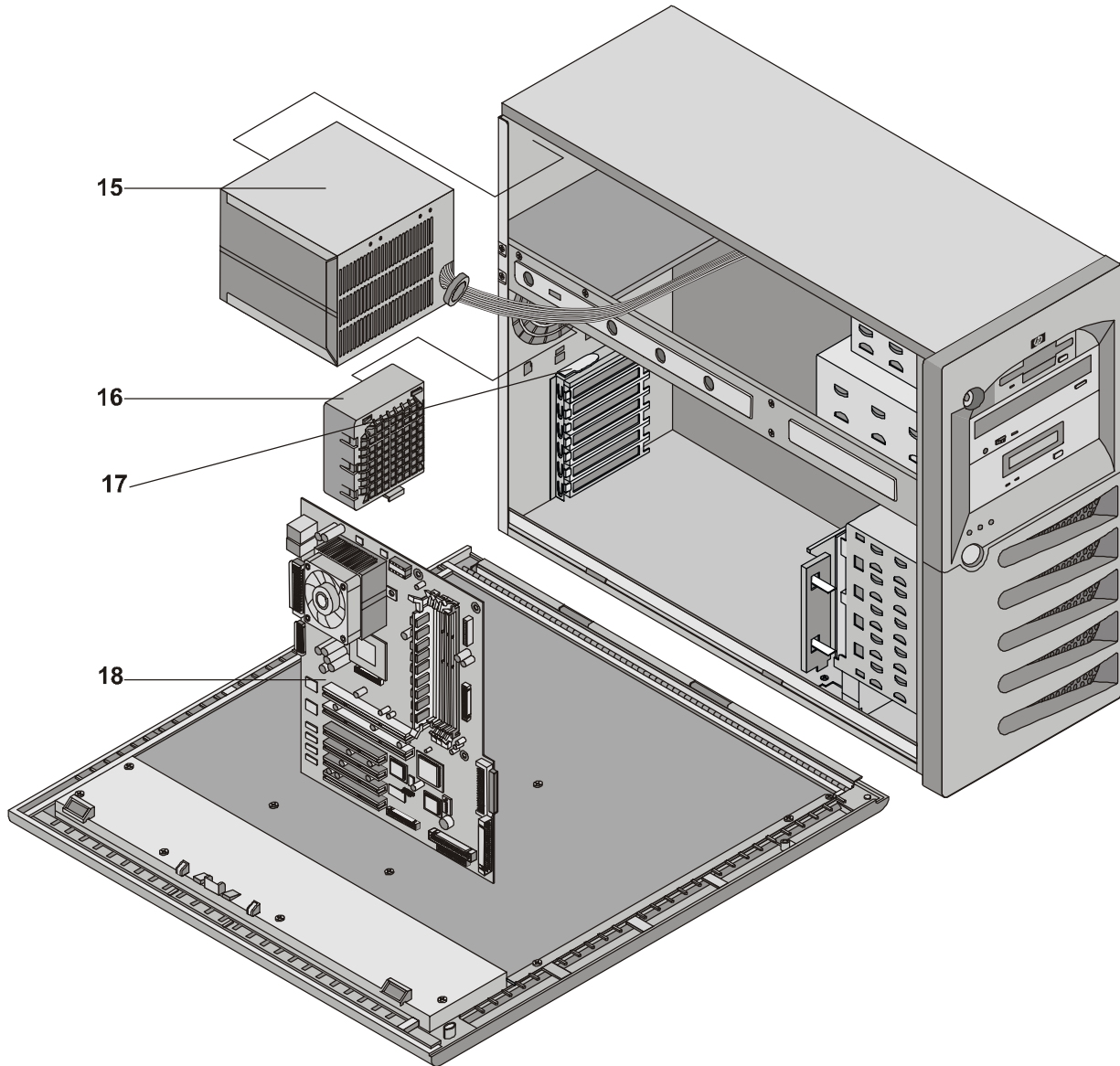
Exploded View – Back Plane and PCI Card Guide Assemblies

19

20

21
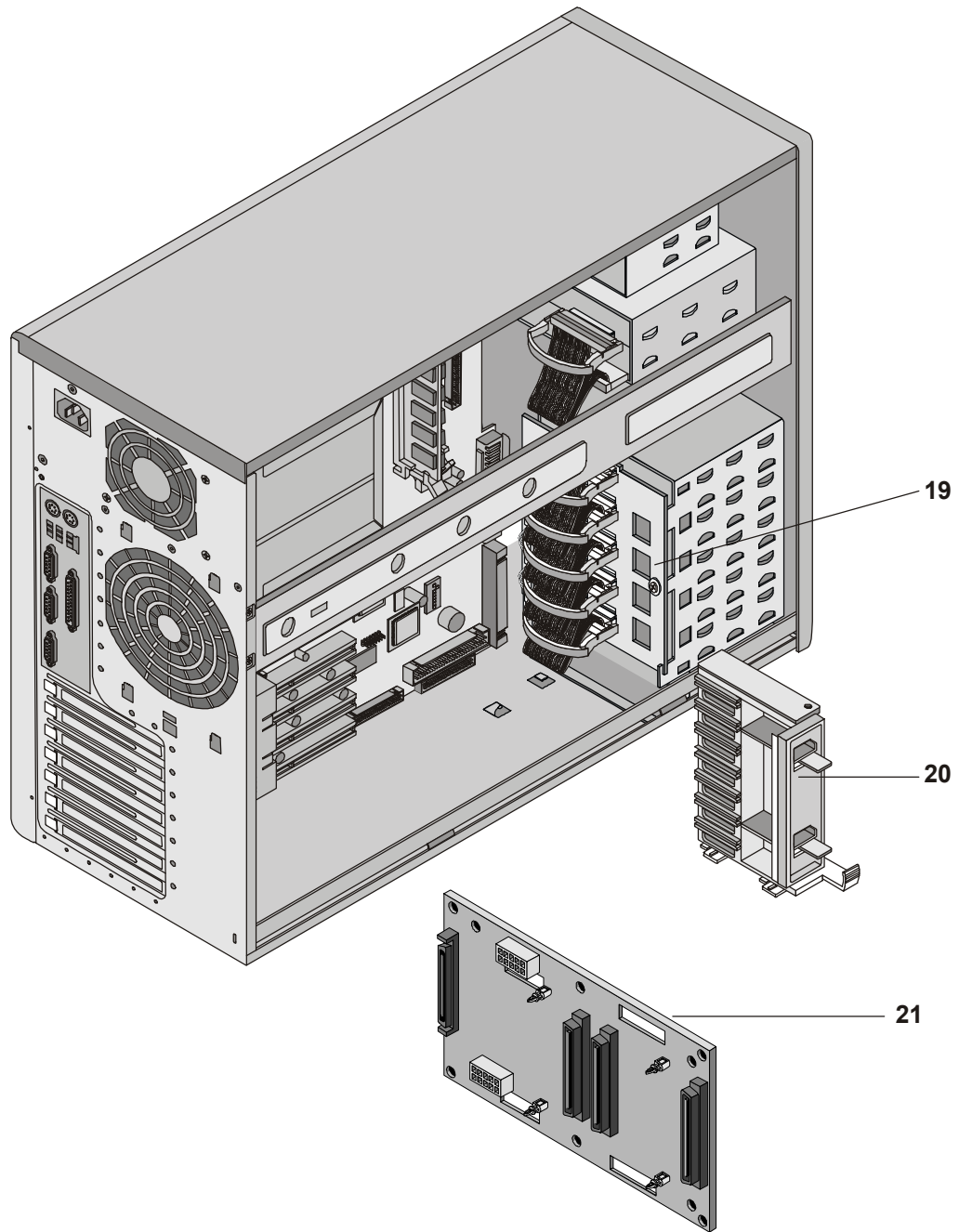
Exploded View – System Board

System Board
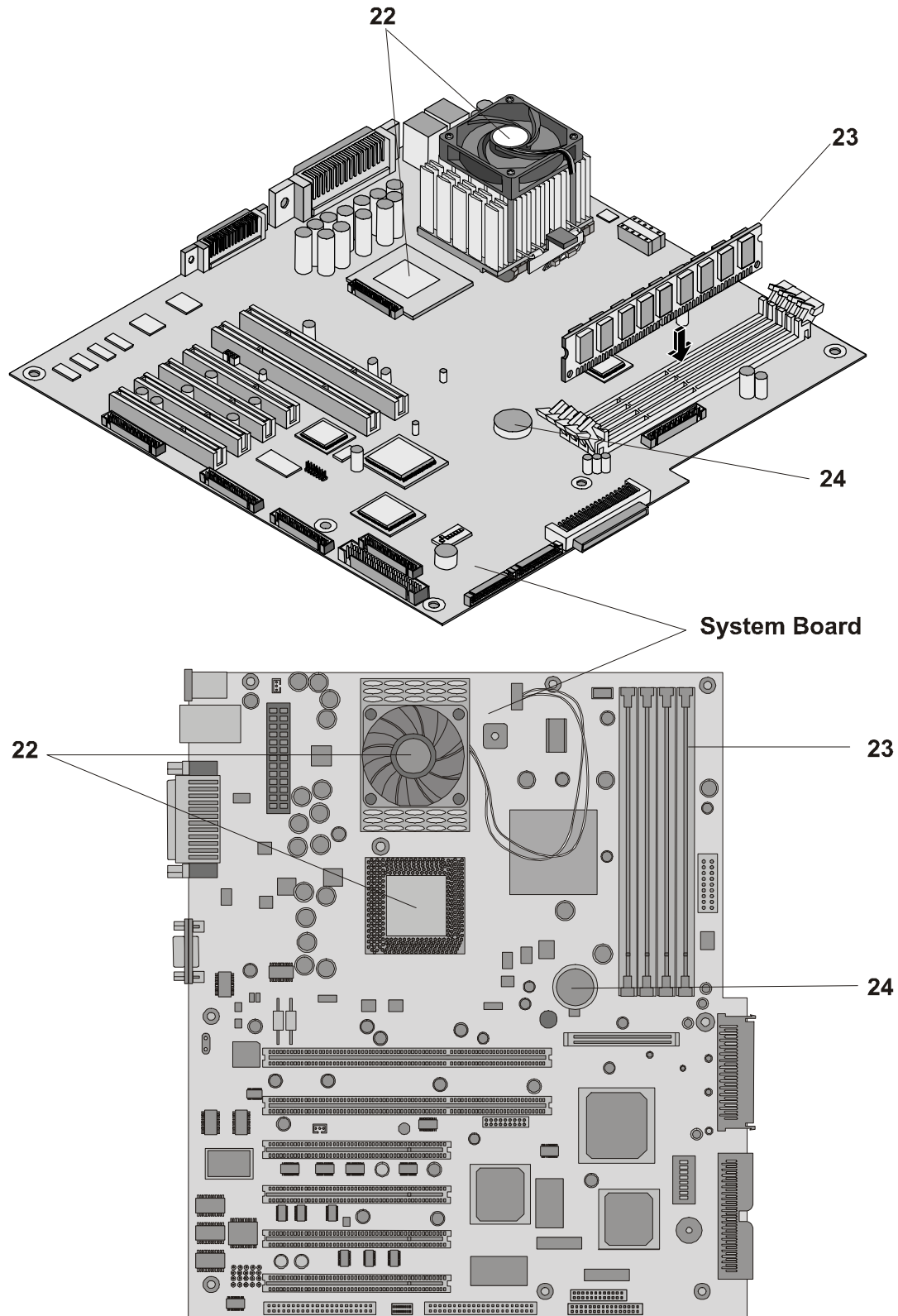
Replaceable Parts List

The items in this list and the corresponding item numbers in the respective exploded views apply to both models of the HP Server, except where noted.

NOTE	The part numbers listed below were available at the time of publication. Part numbers may change after publication. Order parts by the number listed below; HP's parts price list database will generally contain a reference to the revised part number. If a system board needs to be replaced, remove processor modules, DIMMs, or adapter boards and transfer these to the new board. Ensure all jumper and switch settings on the old board are transferred to the new board.

*   This part is not on an exploded view.

**   This Part Number is revised with each new release.

Item No.	Description	Replacement	Exchange
1	Left Cover	P3505-63011	
2	Top Cover	P3505-63007	
3	Right Cover	P3505-63012	
4	Upper Bezel	P3505-63029	
5	Lower Bezel	P3505-63030	
6	FDD with Rail	P3505-63027	
7	CD-ROM with Rail	P3505-63028	
8	Tape Drive, SureStore, DAT24I (Optional)	------------------	C1555-69202
9a	18GB 10K Cold Swap Drive Ultra3	P4460-63001	P4460-6900
9b	18GB 15 K Cold Swap Drive Ultra3	P5480-63001	P5480-6900
9c	36GB 10K Cold Swap Drive Ultra3	P4461-63001	P4461-6900
9d	36GB 15K Cold Swap Drive Ultra3	P5464-63001	P5464-6900
9e	73GB 10K Cold Swap Drive Ultra3	P4462-63001	P4462-6900
9f	73GB 15K Cold Swap Drive Ultra3	TBD	TBD
10	Cold Swap HDD Filler Panel	TBD	
11	HDD 5.25" Filler Panel	P3505-63026	
12a	18GB 10K Hot Swap Drive Ultra3	P4619-63001	P4619-6900
12b	18GB 15 K Hot Swap Drive Ultra3	P4623-63001	P4623-6900
12c	36GB 10K Hot Swap Drive Ultra3	P4620-63001	P4620-6900
12d	36GB 15K Hot Swap Drive Ultra3	P4624-63001	P4624-6900
12e	73GB SF2/SF3 Hot Swap Drive Ultra3	P3577-63001	P3577-6900
12f	73GB 10K Hot Swap Drive Ultra3	P4621-63001	P4621-6900
13	Hot Swap HDD Filler Panel	TBD	
14	Lower Hot Swap Bezel	P3505-63022	
15	Power Supply	P3505-63006	
16	Fan Assembly	P3505-63021	
17	I/O Retainer	P3505-63020	
18	System Board	P3508-63001	P3508-6900

Item No.	Description	Replacement	Exchange
19	Cold Swap Back Plane Assembly	P3505-63001	
20	PCI Card Guide Assembly	P3505-63008	
21	Hot Swap Back Plane Assembly	TBD	
22a	PIII/1.13 GHz, CPU and Heatsink/fan	P4494-63001	P4494-6900
22b	PIII/1.26 GHz, CPU and Heatsink/fan	P4496-63001	P4496-6900
22c	PIII/1.40 GHz, CPU and Heatsink/fan	P5389-63001	P5389-69001
22c	PIII/1.56 GHz, CPU and Heatsink/fan	P5390-63001	P5390-69001
22d	CPU Terminator	TBD	
23a	DIMM, 128 MB	D8265-63001	D8265-69001
23b	DIMM, 256 MB	D8266-63001	D8266-69001
23c	DIMM, 512 MB	D8267-63001	D8267-69001
23d	DIMM, 1GB	D8268-63001	D8267-69001
24	Battery, 3V lithium	1420-0356	
*	Control Panel Assembly	P3505-63005	
*	Diagnostics Board	P3537-63000	
*	Feet (4)	TBD	
*	Key for System Lock	5182-4534	
*	Ultralite Management Card	P5445-63000	P5445-69000
**	HP Navigator CD-ROM	TBD	

Keyboards

Language	Part Number	Language	Part Number
US	D4950-63001	Danish	D4950-63016
Arabic/French	D4950-63025	French Canadian	D4950-63002
Portuguese	D4950-63027	German	D4950-63003
Cyrillic	D4950-63030	Spanish	D4950-63004
Belgian/Flemish	D4950-63014	French	D4950-63005
Italian	D4950-63017	Norwegian	D4950-63009
Arabic/English	D4950-63020	Swiss	D4950-63011
Korean/Hangu	D4950-63021	Swedish	D4950-63012
Taiwan	D4950-63023	UK	D4950-63013
Polish	D4950-63035	Czech	D4950-63036
Hungarian	D4950-63037	Greek	D4950-63032
Turkish	D4950-63035	Dutch	D4950-63006

Power Cords

Country	Part Number	Country	Part Number
Australia/New Zealand	8120-1369	India/South Africa	8120-4211
Canada/United States	8120-1751	Japan	8120-4753
Denmark	8120-2956	Switzerland	8120-2104
Europe	8120-1689	United Kingdom	8120-1351

Cables and Part Numbers

Description	Replacement	Exchange
Diag to Ultralite Cable	TBD	TBD
Cold Swap SCSI Cable	P3505-63013	P3505-63013
FDD Cable	P3505-63014	P3505-63014
CD-ROM Cable	P3505-63017	P3505-63017
Hot Swap SCSI Cable	P3505-63018	P3505-63018
Power Cable	P3505-63019	P3505-63019
Visual Diagnostic Cable	P3505-630	
Management Board to Motherboard Cable	P3537-63010	

9 Specifications

This chapter provides the power requirements, operating conditions (environmental requirements), physical requirements, hardware specifications, and video resolutions of the HP Server tc3100.

The following tables provide the specifications required for normal operation of the HP Server tc3100.

NOTE	The specifications and requirements for the power supply and environment can vary if you install a mass storage device in the server that has more stringent environmental limits than required for the HP Server. Ensure the operating environment for any mass storage devices you intend to install are compatible with the server environmental requirements.

Power Supply Requirements

Parameter	Characteristics
Input Type	Wide-ranging, PFC
Input Voltage	100 to 127 VAC ± 10%, 50/60 Hz 200 to 240 VAC ± 10%, 50/60 Hz
Operating Current	100 VAC:　　　3.49 A, 345 W 120 VAC:　　　2.69 A, 339 W 200/208 VAC:　1.80 A, 329 W 220/230 VAC:　1.56 A, 325 W
In-rush Current	50 A peak, 240 VAC
Operating Power	320 W Continuous

Environment

Parameter	Conditions
Temperature	
Operating	5° to 35° C (41° to 95° F)
Non-operating	-40° to +65° C (-40° to +149° F)
Humidity	
Operating	20% to 80% relative humidity, non-condensing
Non-operating	5% to 95% relative humidity, non-condensing
Altitude	
Operating	-30 to 3,000 m (~ 10,000 ft)
Non-operating	-30 to 12,000 m (~ 40,000 ft)
Thermal Output	
Maximum Operating	1662 BTU/hr
Acoustic Emissions	Sound level (LpA): <40 dB(A)

Weight and Dimensions

Weight	Approx. 33 lbs (16 kg.) for base model – excludes keyboard, monitor, and optional accessories.
Height	17.44 inches (443mm) with feet; 17.32 (440mm) without feet.
Width	8.5 inches (216mm)
Depth	24.38 inches (619mm) including 5mm fan dimple.

Hardware Specifications

Processors	Intel Pentium III (up to 2 processors), supported speeds: 1.0, 1.13, 1.26 GHz; 1.40 GHz and possible higher, 512 K level 2 cache on processor.
Chipset	Serverworks LE chip set with 133 MHz bus speed support.
Memory	Supports up to four PC133 SDRAM DIMMS for a maximum total of 4 GB. Supported DIMM types: 128MB, 256MB, 512 MB, and 1GB buffered, 72 bits wide, ECC single-bit correcting, multi-bit detecting.
Video	Embedded ATI Rage XL chip video with 8 MB SDRAM.
SCSI	Embedded Symbios Ultra-3 SCSI dual channel controller; 160 MB/s transfer rate with two 68-pin connectors.
IDE	Embedded Enhanced-IDE dual channel controller.
LAN	Embedded Intel 82550 10/100 PCI Fast Ethernet Controller; with Wake-on-LAN enabled/disabled via BIOS setup.
PCI Bus	Four 32-bit slots at 33 MHz; two 64-bit slots at 66 MHz.
I/O	Two Serial ports and one bi-directional parallel port with ECP/EPP high-speed support; PS/2 style mouse and keyboard connectors.
CD-ROM	Bundled CD-ROM drive; IDE interface.

System Board Layout

System Fan   **Processor 1 (CPU 1)**   **CPU 1 Fan**

Power Connector

CPU 2 Fan

Processor 2 (CPU 2)

Battery

SCSI A

Wake-on-LAN

SCSI B

Config Switch

IDE2

ERMC   **IPMI**   **FDD**   **Status Panel**

System Board (Top View)

LAN
USBs

Mouse and Keyboard

Parallel Port

Serial A

Serial B

Video SVGA
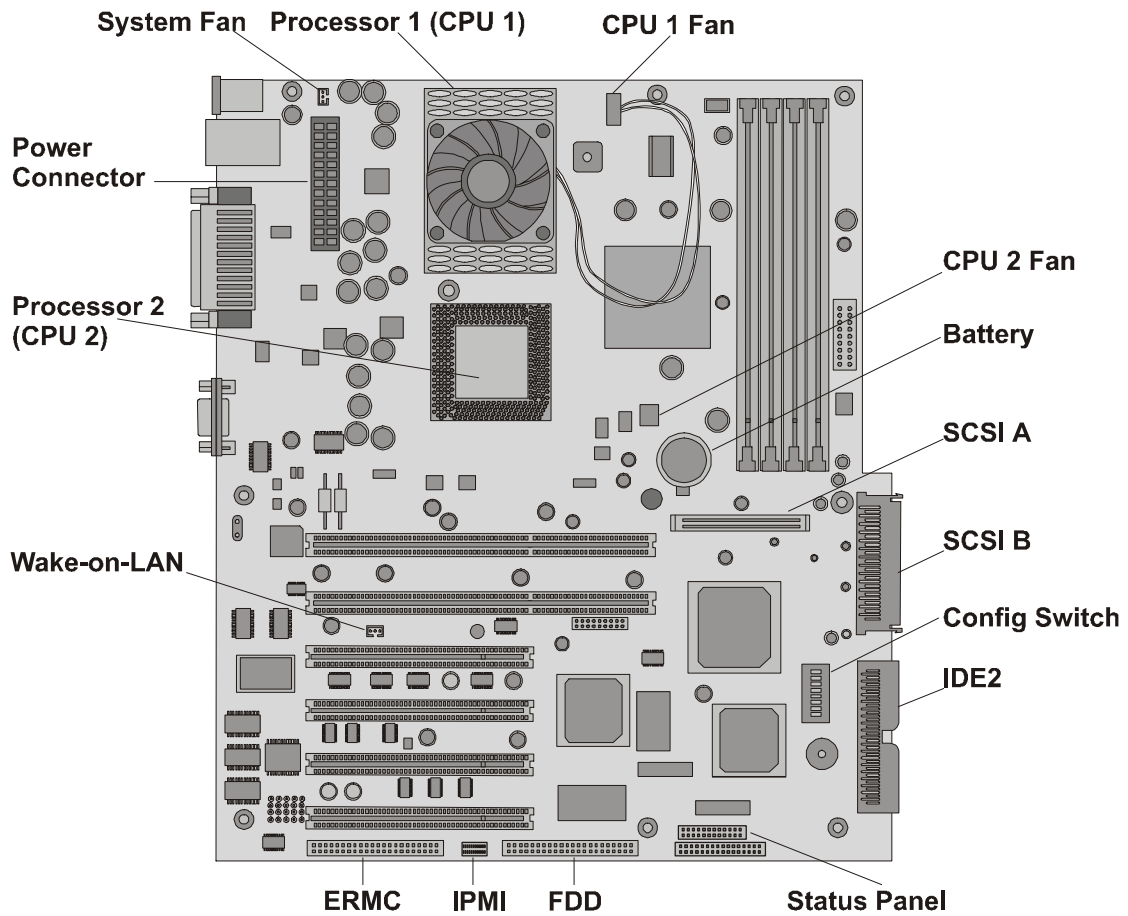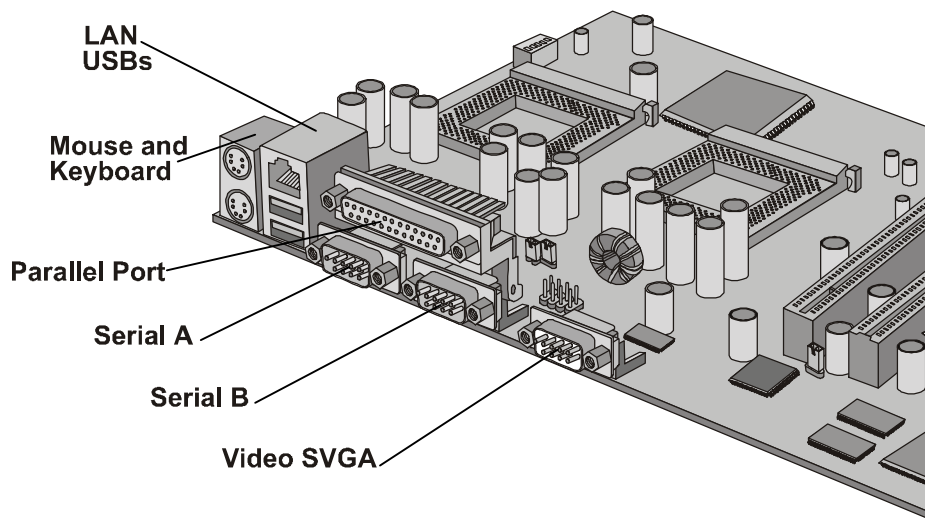
System Board (Side View)

Figure 9-1. System Board Components/Connectors
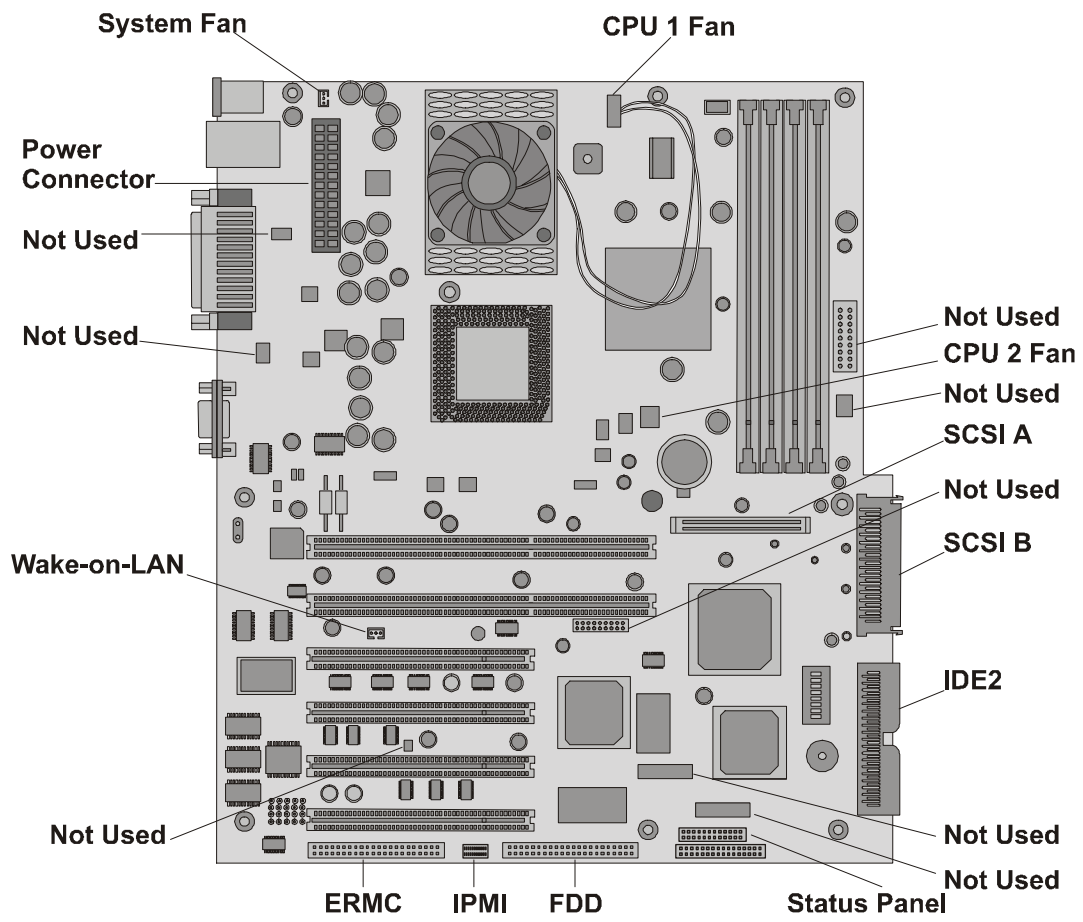
Figure 9-2. System Board Connectors (Used/Unused)

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